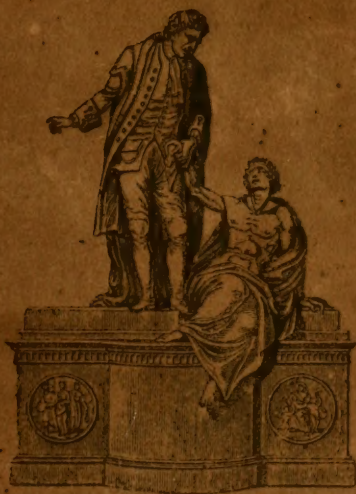


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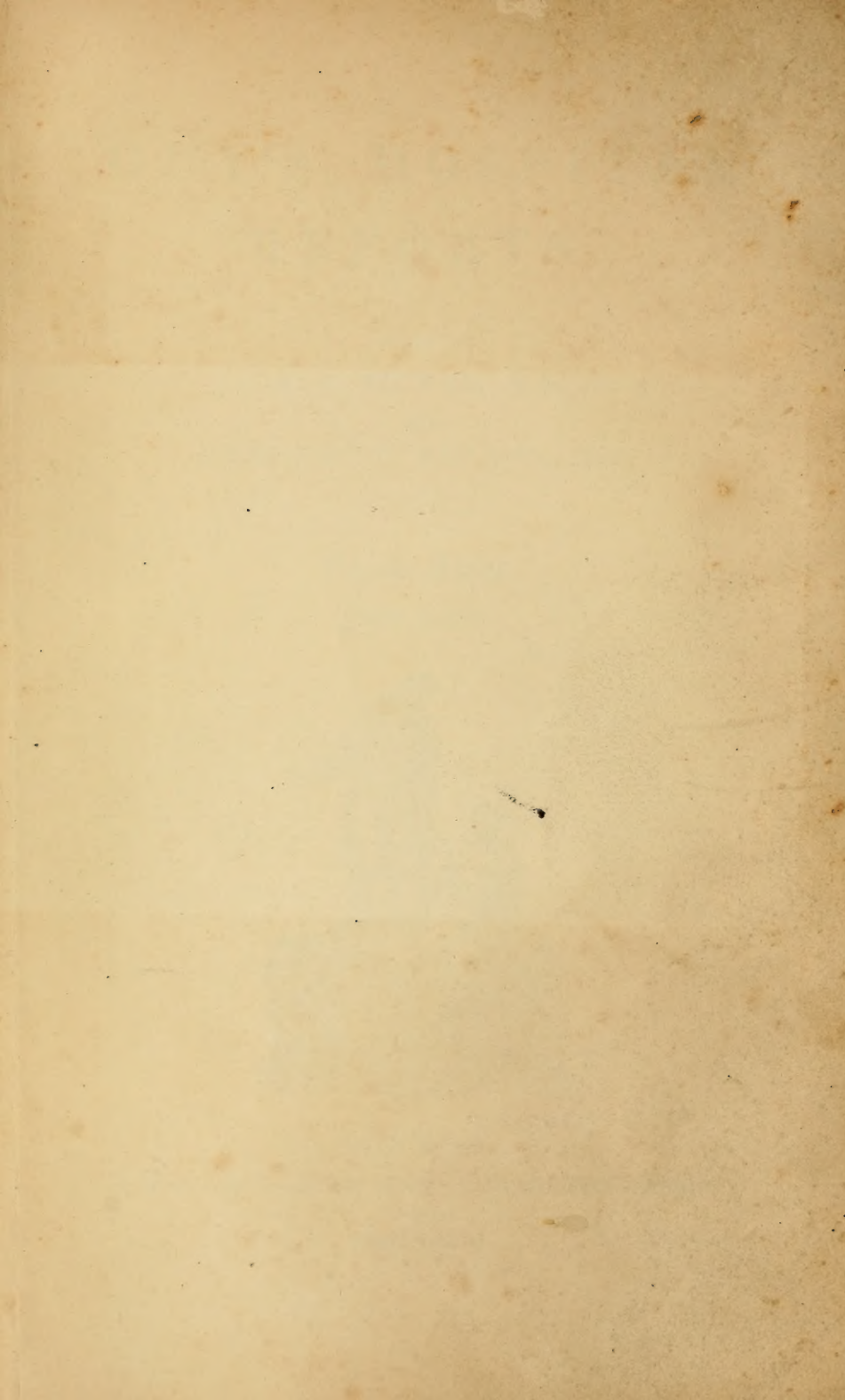
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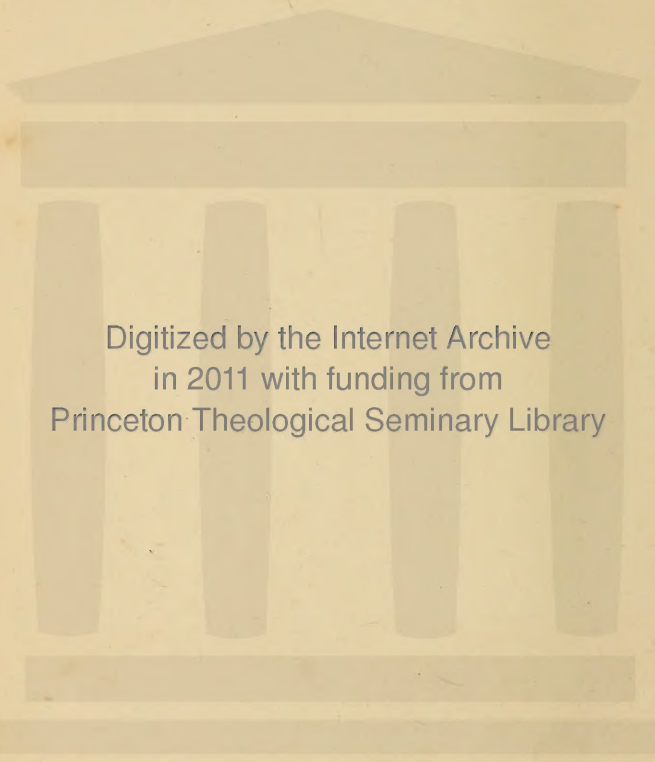
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A FEW REMARKS
ON
PRIMARY SYPHILITIC SORES,
WITH THE VIEW OF EXPLAINING
THEIR CONDITION AND APPEARANCE AS ALTERED AND MODI-
FIED IN ACCORDANCE WITH THE DIFFERENCE OF THE
TEXTURES ON WHICH THEY ARE SITUATED.

By EDWARD COCK.

DURING a period of nearly fifty years I have recorded some thousand cases of *syphilis* in hospital and in private practice, and have endeavoured to draw from my experience a few results which I trust may be of some use in leading to a fairly accurate diagnosis and prognosis. Venereal sores, *i. e.* sores resulting from intercourse, are broadly divided into two kinds, viz., "simple sores," which do not contaminate the blood, and syphilitic sores which are followed by secondary symptoms of more or less severity. It is to *syphilitic* sores alone that my observations refer.

Any part of the penis, from its root to its apex, may become the subject of a venereal sore. They more rarely occur on the body of the penis, and most frequently on the extremity of the organ, affecting the internal and external layer of the prepuce, the frenum, the surface of the glans, and the orifice of the urethra.

I believe that some lesion of the surface, either incurred in

intercourse, or existing previously in the form of herpes, or a depraved condition of the internal prepuce, is necessary to the production of a syphilitic sore. Simple sores, and those which have imbibed the syphilitic poison, resemble each other so closely in their early stage that it is very difficult, frequently impossible, to distinguish between them. We wait for some modification in the appearance of the sore, some alteration in its condition, before we hazard a decided opinion as to its nature and probable results.

Amongst the modifications and alterations which are familiar to, and are appreciated by, a practised eye, there are none so decided and so easily recognised as the induration, the result of solid effusion, so characteristic of a syphilitic sore. Hence the well-known distinctive division of sores into hard and soft. This induration varies as to the time of its advent. It is sometimes found surrounding the sore in its early stage, constituting what is called Hunter's chancre. Sometimes it is much later in its development, and not unfrequently is cotemporary with the healing of the sore, when it assumes the form of a raised gristly callus instead of the usual cicatrix of a common healed ulcer. Much stress is deservedly laid on this solid effusion and induration as establishing the syphilitic character of a sore, and rendering the occurrence of "secondary symptoms" all but a certainty. The amount and extent of induration has been said to indicate and foretell the extent and severity of the "secondary symptoms." I believe there is much fallacy in this opinion.

My experience would show that the extent of the induration connected with a syphilitic sore, and the amount of its density, is governed much more by its situation and the textures involved than by the virulence of the inoculated poison. The same poison imbibed may in one part of the organ produce the most extensive and unmistakable syphilitic induration, while in another region the solid effusion is so limited as hardly to distinguish the ulcer from an excoriation or a common "soft sore."

I have already mentioned the different localities of the penis which may become the subject of syphilitic sores, and I enumerated and distinguished them in order to establish the fact that in each of these regions the solid syphilitic effusion

will be found to take place in different degrees of extent and density. These differences depend upon the amount of loose subcutaneous cellular membrane existing in the different regions referred to. The greatest amount of areolar tissue will be found between the external and internal layers of the prepuce. It exists abundantly but in less degree on the body of the penis and about the frenum, while it is nearly deficient on the surface of the glans and at the orifice of the urethra. The more cellular membrane, the more solid deposit. Its abundance favours, while its deficiency resists, the induration which is so characteristic of syphilitic inoculation. Thus we shall find that sores on either surface of the prepuce are accompanied with the greatest amount of induration. It is often the first indication to the patient of the mischief he has incurred, the original lesion being so minute that it has escaped his notice, and is no longer to be traced by the surgeon. It sometimes forms a dense solid ring round the margin of the prepuce, causing phimosis and consequent subpreputial mischief. The solid deposit is sometimes found in the shape of a large tubercle, which is very difficult to get rid of, and does not become absorbed until after a long period. A friend of mine, Mr. Tuckett, who many years ago was assistant-surgeon to the Dreadnought, was in the habit of excising these refractory tubercles in certain cases, and had a jar of them kept in pickle. I have occasionally adopted the same plan, and with good success.

Sores on the body of the penis hold an intermediate character as regards solid deposit. The induration beneath the sore has but little thickness, and is best appreciated by raising the ulcer between the thumb and finger. I believe it has been called the parchment sore, and its subsequent cicatrix is raised and dense.

As regards syphilitic lesions involving the frenum the amount of induration will mainly depend on the quantity and looseness of the cellular membrane which varies in different individuals.

Sores incurred on the surface of the glans and around the orifice of the urethra are accompanied by the smallest amount of solid deposit, the induration being hardly appreciable, although it sometimes forms a delicate but very characteristic ring around the lips of the urethra.

The law which I have endeavoured to establish, viz., that syphilitic solid deposit mainly depends on loose areolar tissue, is well exemplified in those sores which so frequently occur in the coronal groove, involving at once the root of the prepuce and the base of the glans. There is abundance of solid effusion on the former, but little or none on the latter.

I have thought it worth while to make this record of my experience, to show that the amount of solid effusion attending syphilitic sores has no relation to the virulence of the poison contaminating the blood nor to the severity and extent of the expected constitutional affections. Indeed, I shall endeavour to prove that the one is in reverse relation to the other, and also that, from the situation of the primary sore, a fairly reliable prognosis may be established as regards the nature and extent of the "secondary symptoms" to be apprehended, enabling us to prophesy as to the results and to treat the case with increased confidence.

Patients are eager to know what they may expect, and it is often most important that we should be able to answer their inquiries.

The reliance which has been placed on the presence, the extent, and density of the solid deposit accompanying or following syphilitic sores has led to much confusion as regards the distinction generally adopted between hard and soft, simple and specific ulcers, and tends to obscure and mystify our opinion on the nature of the disease and its probable results.

I lay no stress on the size of a sore as having any particular influence on its results, and I must also discard for my present purpose the difference in constitution, temperament, habits of life, and other circumstances, which will necessarily modify primary appearances and "secondary symptoms," and also the treatment to be employed.

After comparing the records of a vast number of complete syphilitic cases, I have come to the conclusion that the seat of the primary ulcer is a most important feature in our diagnosis and our prognosis.

I have already pointed out the different parts of the penis on which sores may occur, and the same arrangement will hold good for our present purpose. I would impress, as a broad rule, that the farther the sore is removed from the solid

structures of the organ, that is, the glans and body, the less severe will be the consequent constitutional symptoms. Thus we find that marginal sores, which frequently occur along the extreme edge of the prepuce, although decidedly specific in their character, are seldom or never productive of extensive or severe "secondaries." A few patches of roseola on the body or some scattered lichen will probably be the only result. Not unfrequently even these are wanting, or perhaps a mild specific affection of the fauces will indicate that the poison has reached the blood.

2nd. Syphilitic sores affecting the internal or external prepuce may be considered more serious in proportion as their position is farther removed from the preputial margin, and nearer to the base of the glans and the main body of the penis.

3rd. Sores occurring on the body of the penis are more formidable than the two previous classes, and I have reason to believe that the nearer they are to the pubes the more may be apprehended.

4th. Sores on the glans, more especially when situated at its base, involving the coronal groove and corresponding portion of the root of the prepuce, are most to be dreaded. They almost inevitably, even in spite of early treatment, are followed by widely diffused and long-continued constitutional symptoms, frequently baffling the skill of the surgeon and wearing out the patience of the sufferer.

5th. Sores contracted on the frenum become more or less important according to their extent. When they destroy the entire fold of the frenum, and involve its attachment to the glans and prepuce, they may be classed as sores of the coronal groove.

ON
CEREBRITIS, HYSTERIA, AND BULBAR
PARALYSIS,

AS ILLUSTRATIVE OF

ARREST OF FUNCTION OF THE CEREBRO-SPINAL CENTRES.

BY SAMUEL WILKS, M.D.

CEREBRITIS.

I PLACE ON record some cases of marked general cerebritis in order to compare and contrast the symptoms of this disease with those of the more specialised lesions of the brain. The obscurity of the former compared with those of the latter is dependent upon the vastness and extension of the morbid process; for most cerebral diseases arise in given anatomical and physiological districts, and present, therefore, almost necessarily characteristic phenomena; this arises probably from the various regional divisions of the brain having their own special vascular supply. For example, the frequency of hemiplegia is evidently due to a very defined portion of the brain receiving its blood from a vessel exceedingly liable to be affected or disturbed by rupture, embolism or inflammatory processes. Independently too of the vascular supply there is a tendency for morbid conditions to confine themselves to given anatomical centres and physiological tracts; this is probably

owing to some intimate union between cells and fibres associated in function. For example, there is the disease of the pons in the so-called bulbar paralysis as well as special morbid processes in the cord ; as in the posterior columns in one case, in the anterior in another, and in a given portion of the grey centres in a third. When, however, the hemispheres of the brain are involved, the symptoms are of the most obscure character ; there is no definite paralysis, but only a slow failure of strength ; no delirium or mental excitement, but only a gradual diminution of intellectual power, so that, as in some cases given below, where a most extensive disease was present, a doubt had been expressed as to the existence of any organic change at all, or whether the loss of vigour could not be accounted for by a mere temporary abeyance of function.

It is evident that our physiological and pathological knowledge is not very far advanced when we are obliged to take the brain, or rather the hemispheres as a whole, and speak of the symptoms dependent upon their derangement, since the changes in all these cases cannot always be equal in degree or extension. In those instances which I call *cerebritis* a large part of the cerebral hemisphere was involved in the inflammatory process, including the grey matter on the surface, the medullary matter within, and in extreme forms the central ganglia also. In these cases defined masses of exudative product massed together the tissues of the brain, and it is therefore evident that I am not referring to the more common instances of *ramollissement*. The grey matter may undergo inflammatory changes in its substance without any very marked products being found in the meshes of the pia mater, and so the term *cerebritis* may be strictly used for inflammation both of the medullary and grey matter, but inasmuch as a *meningitis* implies an inflammation of the surface of the brain, this term might be used in conjunction with that of *cerebritis* and yet be little more than equivalent to the latter only. It is true that a simple *arachnitis* may be nothing more than an inflammation of the dura mater surface, but an idiopathic inflammation of the membranes of the brain, usually styled *meningitis*, is characterised essentially by disturbance of the grey matter with which it is closely associated. Hence we might fairly substitute the term *cerebritis* in many cases for *meningo-*

cerebritis, since it would denote equally well that the grey and medullary structures were both involved in the inflammatory process. The case would be analogous to that of the granular kidney with its thickened capsule or the chronically diseased lungs adherent to the chest.

When the brain has undergone a slow inflammatory change throughout a large part of its substance we find its function slowly departing, evidenced by a gradual decay of mental and bodily power, until a complete dementia paralytica results. Such a termination is witnessed in a large number of cases of disease of the brain whose pathology has been as different as the course they have run. A period will come when these will be analysed according to their causes and symptoms, much in the same way as is done with other organs, as, for example, the kidney. When this organ is structurally destroyed certain definite uræmic symptoms ensue, but the disease may appear as a granular kidney, a fatty kidney, a lardaceous kidney, or a suppurating kidney; and we know that in each of these cases the history has been peculiar both in symptoms, cause, and duration. In the same way analyses will one day be made in the symptoms and histories which lead to destructive changes in the brain. At present we recognise such diseases as melancholia, general paralysis, and other affections from the mental side; meningo-cerebritis, diffused sclerosis, and some other forms from the pathological side,—it will be for some future clinical observer to connect the two series of facts. It is my purpose here to relate some cases of the more marked and coarser inflammations.

As regards the symptoms the first thing noticeable is the absence of all those characters which imply disease of the spinal system; there is no paralysis of any part of the body, the patient is simply devoid of mental power, and may therefore resemble one who is suffering merely from a depraved circulation of blood. The first case I ever saw of the kind was that of a young man who was in the hospital under Dr. Barlow, and admitted for fever. He lay in bed in a torpid drowsy state, having his eyes open, and looking at persons as they passed up and down the ward; he never spoke, although he seemed to understand simple questions which were put to him. He finally sank into a state of coma and never had one

active symptom. After death his brain was found to have undergone an inflammatory process throughout its substance, and in some parts was pulpy. I have said that the grey matter may be involved without the existence of any of those inflammatory products in the meshes of the pia mater which would warrant the expression meningitis, but even should this be the case the symptoms may still be of a purely negative character. It is true that in the early stage of inflammation of the membranes some amount of excitement, delirium, or convulsions may occur before the final torpor or coma comes on, but in very many cases the latter has been the only symptom present indicative of the inflammation. Certainly it is the only symptom common to all cases of meningitis. I cannot but think that contrary opinions, those which imply a maniacal excitement as a necessary consequence of inflammation of the brain, have had their origin in the vulgar notion attached to the word inflammation. The word is one of fiery import, and seems to carry with it everything which is intense in the form of pain, disturbance, or excitement; therefore it was that mania, delirium tremens, cerebral rheumatism, and even fever were regarded at one time by different physicians as indications of inflammation of the brain. Clinical observation and post-mortem examination have shown the error of these conclusions, and a little consideration of the subject will show the rationality of the actual facts. The case is a good illustration of the advantages which inspections of the dead have afforded us during the last thirty years; a fanciful picture of the symptoms of inflammation of the brain had been painted in the writer's study and then made to represent the diseases just mentioned; it is now known that where this furious excitement or delirium is seen, meningitis does not exist, and that the symptoms exhibited in the diseases named are not those of inflammation of the brain. I therefore regret to see such a question as the distinctive differences between meningitis and delirium tremens put to students at examination, as if it implied that these diseases might reasonably be mistaken for one another. The main features of inflammation of the brain, whether it be styled meningitis or cerebritis, are those of impairment of the functions, indicated, in a word, by torpor. Some excitement may for a time prevail, but certainly nothing like what is seen in an

attack of delirium tremens; at least, it remains for me to witness for the first time a patient with meningitis sitting up in bed, constantly moving about, looking under the bed, or wandering about the house as in the wild excitement of delirium tremens. The term inflammation seems to have been carried with it purely imaginary symptoms, but as far as these have been described of a violent kind they, as a matter of fact, have no existence, and as a matter of reason they could not occur. Inflammation tends to destroy and paralyse parts; increased function and excitement are more closely related to the natural state of an organ; exaltation is due to a surplus supply of arterial blood, whilst, on the contrary, diminished supply and stagnation of blood bring about impoverishment of the organ with lessened function. The stomach, for example, during digestion draws to it an increased flow of blood, and the brain during active processes of thought is, in the same manner, more highly vascular in contrast to its state during sleep, in which, as Mr. Durham has shown, it becomes anæmic. There may be morbid processes in which a too great arterial supply is furnished to the head, and the example is shown in some forms of intense headache, which are much aggravated by the horizontal posture, and relieved by bandages, by cold, and by the upright position. In this condition of brain more than one patient afflicted with migraine has informed me that in spite of the pain his mind is unusually active, and sometimes preceding the attack an almost painful intensity of thought will come on, urging the patient to attempt the solution of the most subtle problems in nature. These patients say their head is hot and their arteries throbbing, whilst their feet are cold. I might add that the lesson which is taught by the popular practice of curing a drunken man by putting his head under the pump is not sufficiently enforced by us in analogous cases of hot head. It follows that if, therefore, there ever was a time in the course of inflammation when a more rapid stream of blood flowed through the arterioles, an exaltation of function and over-activity of the organ would be the result. It is a question, however, if this ever occurs, for if the inflammatory processes be witnessed in a bat's wing or elsewhere it will be seen that a stasis or retardation takes place. Now, if this be so in all organs when inflamed, whether brain, stomach,

or kidney, it must imply an impairment of function. In the brain dulness and torpidity would be the consequence, and in the next stage, when exudation occurs and the vital secreting cells of the organ are involved, no argument need be used to show that function is becoming impossible, since every case proves it. As soon as inflammation of the brain is perfected a paralysis of the mind must result as surely as paralysis of the limbs from inflammation of the spinal cord, or as surely as a dilatation and paralysis of the intestine from a peritonitis or paralysis of the heart from myocarditis. It is simply the influence of an erroneous preconceived opinion which causes us to regard activity of the function or violent disturbance of an organ as a consequence of so great a change as must occur in inflammation; the worst headache is met with in the brain free of disease, the most urgent vomiting in the structurally healthy stomach, and the worst colic in the healthy bowel. The association of violence of symptoms and inflammation is the mere remnant of a popular fallacy not yet eliminated from the ranks of the profession. This has made me trespass on the general ground of the symptomatology of inflammation as suggested by the special form of meningitis or cerebritis.

In a simple inflammation of the substance of the brain including both grey and medullary matter the symptoms are mainly those of increasing torpidity, and even in those acute forms of meningitis where the grey matter on the surface is involved, this lethargy may be the only symptom. It may be sometimes true that for a short period of excitement headache or convulsions may occur, but this is by no means necessarily the case, so that it repeatedly happened in former years, when I had charge of the post-mortem room, that the dressers would declare their ignorance of the cause of death of patients who had received injuries to the head, since there had been no reason to suspect any unfavorable issue until a lethargic state had come on, which passed gradually into that of coma. When under these circumstances an acute meningitis was found, the dresser as well as the house-surgeon declared that the patients had not a single symptom of the disease, meaning, of course, the imaginary malady of which they had read. In inflammation of the brain, then, or cerebritis, the symptoms are those of impairment or

loss of function of the cerebral hemispheres; there is want of volition and a loss of perception, the latter including not only common sensation, but the special senses. The patient cannot, therefore, take cognizance of objects around him; he cannot understand what is said to him, his perception and reasoning faculties are fading away, and at the same time as his volitionary powers are being destroyed he is becoming to all intents and purposes paralysed in his body, whilst his mind is a blank and his will has gone.

The only question I cannot here fully discuss is that of the probable seat and cause of pain or headache. I have already said that inflammation of the substance of the brain may occur without it, and there is every reason to believe that this is true of inflammation of the membranes; at the same time the most severe headaches are those which are purely functional. In organic diseases the greatest suffering has been where the membranes have been involved, and therefore it might be suggested that congestions and stretching of the dura mater are the more usual causes of pain in all forms of headache. In few and exceptional cases I have observed headache with cerebral softening, as also in some cerebral tumours; but inasmuch as pain is not a necessary symptom, it might have been due to some implication of the membranes or neighbouring parts. That the primary congestion attending inflammation of the membranes gives rise to headache is well known. I have seen intense headache in thrombosis of the sinuses, and I believe there is a congestion of the vessels in ordinary migraine. Pain may therefore depend upon the accidental concomitants rather than upon the actual nature and seat of the disease.

The circumstances under which a general cerebritis arises are not always evident. In one case I believe an injury had been the starting-point, as the patient, a young man, immediately after an accident took to his bed, where he lay in a torpid helpless state for many months until his death, when it was found that his brain had been undergoing a disintegration throughout the whole of its substance. In this case, as in a very similar one where a man lay motionless in bed for nine months, the bones of the skull had become remarkably thin and covered with granulations on their inner surface. In the case of another lad, already alluded to, where every portion of the brain was

pulpy, not a single active symptom existed; he merely seemed very dull of apprehension and was powerless to move.

In some cases alcohol may be the cause, and the condition of brain then found is only a more acute form of what is met with in chronic alcoholism and delirium tremens. For example, quite recently a man of middle age came to the hospital, with a history of having been in better circumstances, and of late he had become a hard drinker. He was unable to stand, but he sat up in bed and answered questions in monosyllables. It was evident that he did not understand what was said to him and that his mind was gone. He said nothing, did nothing, and therefore it could not be learned whether or not he had illusions or hallucinations. His mental state was a purely negative one, and as regards any sign of comprehension, he might have been a vegetable instead of a man. After death there was found a marked meningo-cerebritis; the membranes were adherent by a tough yellow lymph imbedded in the meshes of the pia mater; the brain itself was everywhere undergoing inflammatory changes and the ventricles showed an excess of fluid and their surface was granular. At the same time the kidneys were nodulated, the liver cirrhotic and the lung the subject of fibroid degeneration. In a case of this kind there could be no doubt that the brain was seriously and deeply involved, but there might be circumstances surrounding or accompanying such a case rendering it to the last degree obscure. If for example pyrexia were present, there might be a doubt whether the cerebral disturbance was not due merely to a blood change, and in the case of women even a still greater difficulty might exist, since in many affections of the hysteric type a simple torpid state of mind is common enough. A case I shall presently give will illustrate this. So difficult, indeed, is it to pronounce upon the existence of a real disease when the cerebral hemispheres are alone involved that in the instance of a lady who lately died after a fortnight's illness several of the most accomplished physicians in London failed to recognise anything but a functional or hysterical condition. Then, again, if it be clear that a structural disease exists owing to special symptoms, and a fatal issue is pending, a diagnosis of the exact nature of the case is often still difficult, from the fact that a local disease like a tumour may interfere with the natural working of

the whole organ through some reflex process. An example of this I shall give although the difficulty decreases if the case can be watched for some time and the absence of the more distinctive signs of tumours be noted. It must be well known that cases occur in lunatic asylums which have been regarded as dementia, melancholia, or general paralysis, whereas nothing but a localised tumour has been present.

If it be true that a general cerebritis tends to destroy the function of the brain, it would be interesting to observe the effects of an inflammation affecting only one half of the organ. I do not think I have ever seen such a case where the process began primarily and continued throughout the substance, and, therefore, the only condition where one could look for a case of the kind would be in a unilateral meningitis where the grey matter was involved. Now, in such a case as this a hemiplegia, or what is equivalent to it, does occur, and I have already published several cases of it in these Reports. There was a case also of a nurse in the hospital some years ago who had a primary affection of the grey matter over one hemisphere, arising from a blow, and her symptoms were very remarkable. She lay perfectly quiet in bed, but appeared sensible to everything around her, and did what was told her; she spoke with difficulty and with great deliberation, waiting a very long time before she could answer. Her left limbs were paralysed, but she never realised the idea that they were so, as she always asserted that she could move them.

Besides these more marked forms of inflammation, it is very probable that there are instances of it where the changes in the substance, being less evident, it has been thought that the disease has been confined to the membranes or the ventricles. Thus, but lately, I have had under my care two patients who were admitted with cerebral symptoms, which were of so little distinctive character that we were obliged to regard the disease as one of a general affection of the brain, and yet after death the most striking change was an effusion in the ventricles. This, in all probability, was only the more apparent alteration which had occurred throughout the brain structure.

CASE. *Meningo-cerebritis*.—*Family history*.—Father and mother healthy; one son has had rheumatic fever twice. No history of tumour or consumption.

Personal history.—The first symptom noticed was seven months ago, when she laughed without cause at her mistress and was discharged for it. She was a nursemaid, but could never bear the noise of the children. On leaving service she kept company with a young man who left her, and this caused a mental shock. Since then she has been strange in her manner. Four months ago she began to suffer from incontinence of urine; this has continued since, and the urine is now offensive-smelling. Two months ago she lost the power of walking; she used to be helped up stairs at first, and then carried up. About this time she lost the power of talking, though she could occasionally speak perfectly well. When placed upright in a chair she would bend over till her head reached the ground. When spoken to she generally laughed. The appetite was voracious six weeks ago; since this she has eaten in the way described under present condition. She has complained of pain and aching in her limbs, more especially when warm in bed. She has menstruated regularly till the last three months; since then only once. No history of discharge from the ears, blow on the head, or severe pain in it, or headache.

On admission.—The patient has taken a journey of thirty miles. She is a healthy-looking woman, with a good colour in her face. She has a peculiar stupid expression, and when spoken to generally laughs. When asked a question she seems willing to answer, but unable to do so; she can, however, speak in a slow deliberate tone of voice and very low. When she eats she keeps the food in her mouth for an hour at a time, and does not seem able to masticate her food. She can understand perfectly any questions put to her. There is no paralysis of either side of the face, and sight and hearing are unimpaired. She can protrude her tongue slightly, and it is indented at the edges and covered with a white fur; pupils, generally dilated and equal, contract with light. There is a want of will in all her actions. Right side of body:—When her right arm is placed vertically to the bed she retains it in this position for a great length of time, and can grasp firmly your fingers, but has a difficulty in unloosing her hand. She can write words with her right hand, not with her left.

The right side of her body has altogether more power than

the left; the leg responds better to reflex action by a prick on the sole of the foot; the left leg also responds, but to a less extent. She cannot hold her left arm up in the same way as the right. The right leg is generally moved over the left when the left is pinched.

She has fits of jogging in her right leg; she can feel a pinch anywhere over the body. No heat of skin. She occasionally heaves a deep sigh. Bowels generally confined. She has had no motion while in the hospital. Heart:—There is a thrill over the apex of the heart, but the chest-walls are very thin. No bruit. Chest-sounds and resonance normal.

February 20th.—She has taken hardly any food since her admission into the hospital three days ago. There is a bed sore coming over the sacrum; she is menstruating.

22nd.—Died this morning at 6.20 a.m. Yesterday she could not swallow. In the evening her temperature was 102°.

Post-mortem.—Head:—The falx cerebri was rather adherent to the hemispheres, and on its separation it was seen to be, especially on its right face, thick, and finely tuberculated by yellow gelatinous granulations, like a layer of new tissue; and on section of this layer and of the falx beneath, it appeared that the opinion formed as to the nature of the thickening was correct. The falx itself was unchanged, but lying upon it, more on the right side than on the left, was a layer of granulation tissue.

The membranes of the brain in this region were yellow looking, thickened and adherent to the substance of the organ. This state was most decided anteriorly, but extended back on the right side to the posterior part of the corpus callosum. Elsewhere the membranes were perfectly healthy; they were neither greasy, nor tuberculated, nor opaque. The arteries of the brain looked quite normal. Taking the right frontal lobe between the finger and thumb, it was felt to be decidedly indurated on comparison with the other side, and still more so when compared with other parts of the brain. On section both sides, but especially the right, in the frontal lobes, cut with that peculiar gristly resistance found in cases of sclerosis. Throughout the whole brain this was more or less the case, but it was especially so at the anterior parts.

On removing the upper part of each hemisphere nearly to the

level of the corpus callosum, the cut section showed a peculiar condition. The whole surface of grey and white matter, from the longitudinal fissure outwards as far as, but not involving, the grey matter of the external convolutions, and from the front to a little behind the fissure of Rolando posteriorly, was of a brick-red colour, most intense as far as the anterior part of the longitudinal fissure on the right side, *i. e.* where the granulation tissue on the falx was most decided. The left side, in addition to being red, was also soft, but the right side was hard; it was also noticeable that the grey matter of the various convolutions jutting into the brain from the longitudinal fissure was swollen to nearly twice its proper thickness, and it became quite impossible to define the outline of the convolutions, so perfectly did their outer border blend with the red substance of the medullary matter. On both sides the red tint was noticed from the surface down to the roof of the lateral ventricle, and on the left side the roof of the ventricle was very soft. The corpus callosum was soft and the fornix also. The ventricles and other parts of the brain appeared perfectly healthy; the substance was firm; the cut section purplish in hue from engorgement of the vessels.

Examined microscopically, the parts over the left lateral ventricle (red softening) had the usual appearance of soft brain tissue, *i. e.* numerous granule masses were seen, and a generally corpuscular state of the brain-substance. The tissue from the right side (red induration) showed a remarkable absence of anything like nerve structures, but appeared to consist mostly of vessels and a dimly fibrillated substance.

The medulla, pons and spinal cord were perfectly healthy.

The parts that were most diseased corresponded with the first and second frontal convolutions. The third was healthy on both sides. The disease extended farther back than this in the white substance of each hemisphere, but the greater part on each side would be included in the anterior part of a brain divided vertically across from the commencement of one Sylvian fissure to the other, that is, behind the third frontal convolution on each side.

Weight of brain 45 oz. Venous blood in excess; other organs healthy.

The following were the remarks I made on the case at the

time :—When this girl was admitted, the first impression made on the mind of the clinical clerk was that it was a case of hysteria. This idea was, of course, soon dismissed, when the history was taken, and the symptoms more clearly revealed. The first impression, however, was very natural, and gives a clue to the whole character of the case, for it indicates that there were no striking paralytic symptoms present, and that the girl's manner was both lethargic and emotional. In fact, she presented the symptoms we sometimes see in extreme forms of hysteria. The history, however, showed that her illness began in a tolerably definite manner some weeks before, until she had reached the feeble state in which she was admitted. Then, as the report says, although there was some difference in the degree of power in certain parts of the body, there was no distinct paralysis as the term is usually understood; the inability to move appeared to be owing merely to a failure of the volitional act.

In true paralysis the spinal system is affected, whilst the will is good; hence the patient is seen to make the greatest effort to move an arm or leg, although the result may be negative. In disease of the brain proper, or during its functional abeyance in hysteria, it is the will itself which fails; now it was evident that in this girl the power of acting or willing was gone. She made little effort to move, to speak, or even to masticate her food, and she allowed the bladder to empty itself in the bed. This latter fact removed the case from simple hysteria, where the patient never permits herself to be inconvenienced in this way. She had not paralysis of the bladder, but simply she exerted no intellectual control over it, as in mad people and in the lower animals. The patient had clearly, therefore, some progressive disease of the nervous system, and the question was, where was its seat and what was its nature? The absence of true paralysis showed that the spinal system was not affected, and by the spinal system is meant, not only the cord which is contained in the spinal canal, but the medulla oblongata, crura cerebri, and central ganglia within the cranium. The disease, therefore, was in the brain proper, and this opinion would make the disease coincide with the symptoms, which were rather mental than physical. The question then was as to its being a tumour or a diffused inflammation. The former,

as is known, although localised, may produce in an inexplicable manner a disturbance of the whole brain with a corresponding insanity; but at the same time it is usually accompanied by well-defined symptoms, such as severe pain, sickness, convulsions, and amaurosis due to atrophy of the optic disc: it was therefore concluded that the disease was of a more diffused nature, and largely involved the cineritious matter; it could be none other than inflammation or encephalitis, usually known by the name "red softening." It turned out to be an inflammation, but only a portion of the brain was soft, the greater part of the affected hemispheres being indurated from the effused lymph within it. A considerable part of both hemispheres was structurally destroyed.

In our present state of knowledge it may be said that when a patient has been ill only a short and well-defined time with symptoms denoting a deep implication of his nervous centres and no paralytic symptoms are present, his spinal system cannot be affected, but his brain proper, viz. the hemispheres. He would of course lie in bed in a state of lethargy, having no will to move. Such has been the case in several other instances of the kind.

CASE. *Cerebritis*.—Henry A—, æt. 48, admitted in December. He was a painter and had suffered from the effects of lead; he had been a hard drinker and had also had a severe fall on his head. The history was that, in June whilst painting, the brush dropped out of his hand several times; he went downstairs and then fell on the ground insensible. He soon recovered and walked two miles home. About two weeks afterwards, whilst going to his work, he felt pains in the right leg; these gradually extended up until they affected the arm and head. He soon became insensible and remained so for half-an-hour. He afterwards walked home, when he found he could not speak and was rather deaf. After being in this state a week his speech and hearing returned; the doctor believed he was going out of his mind. He then went to work for five weeks, when a tingling of the left arm came on, and after being at home a month, he again went to work and remained at it for seven weeks. He then began to have much more severe symptoms, such as pains in his limbs and head, swelling of the ankles, dimness of sight, with failure of

memory, and great sleepiness. These symptoms continuing he was brought to the hospital.

He was then in a semiconscious state, and resented being roused or moved; his sight was almost completely gone, and he could only just discern light; there was extensive hæmorrhage into both retinæ, obscuring the optic discs. There was a slight blue lead line on the gum; he was delirious at times and often lay quite unconscious. The kidneys and other organs were healthy. There was no paralysis, for he could move his arms freely. On January 12th he was much the same, lying in bed in a half-conscious drowsy state, sometimes talking but quite incoherently. The ophthalmoscope showed that central absorption was going on in both optic discs, which also had a woolly appearance. At the end of the month he was worse, he lay in bed in an unconscious state, or could only be roused with the greatest difficulty, and bedsores had appeared; he continued in this state, and six weeks afterwards he was still lying apparently unconscious and quite blind. When roused he would sometimes say a word and put out his tongue; he had a fresh hæmorrhage into the retina; no special paralysis of any part. During this time he had been taking the bromide of potassium. At the beginning of March he began to improve and he answered more rationally. He was still quite blind, the pupils insensible and dilated except when asleep; they were then naturally contracted. On the 18th of March he was much better and began to eat. From this time he slowly improved so as to be able to sit up in bed and answer questions put to him quite rationally. On the 24th he got out of bed and walked along the ward. The report of the examination of the eyes was that the optic discs were anæmic, the veins few and varicose, all blood spots absorbed. It was thought that this appearance might possibly denote some block in the cavernous sinus.

He continued to improve and to walk about the ward, and had also apparently recovered his intelligence.

On April 27th he had something of a fit, became almost insensible, and his arms and legs twitched.

On May 10th he was still improving, and was able to sit with the others at table to dinner.

On May 11th he had another fit, was convulsed for an hour, and died.

Post-mortem examination.—On opening the skull the convolutions were found flattened and much compressed. This was not due to an internal pressure of fluid, but to the increased size of the hemispheres from adventitious matter. A section of the hemispheres showed the medullary substance infiltrated with a new material, and more so on the right than on the left side. Its colour and consistence distinguished it from the cerebral tissue, as it was firmer and of a slight grey colour, but in parts it gradually faded off into the natural brain substance. In parts where the new material was massed together it could be felt by the finger, and was tolerably defined owing to its hardness. It spread through the hemispheres and encroached on the cineritious substance, pushed the convolutions aside, separated them, and absorbed some of them. Many convolutions were destroyed, and they then appeared to be fewer in number with long distances between them. Until it was evident that a new material had been formed the first appearance might have suggested an hypertrophy of the white substance of the brain, with an absorption of the cortical part. The great mass of new matter, amounting almost to a tumour, was in the right anterior lobe, encroaching on the Sylvian fissure to the outside of the corpus striatum. The central ganglia, however, were untouched, the cavernous sinus healthy. A section of the pons Varolii showed some minute and recent extravasations into its substance.

This case is full of interest in connection with the symptoms, these gradually abating as the disease progressed. There seems no other explanation than that those portions of the hemispheres which were found intact, and which, no doubt, had been until his death in healthful action, must have been at the time of admission seriously involved. But whether they were merely rendered inactive by some reflex inhibitory process or were really the subject of an inflammation which was recoverable, and which, in fact, was recovered from, is difficult to say.

CASE. Cerebritis.—A little girl, æt. 14, began to be ill about a year before admission with symptoms pointing to the brain, although of a very undefined character. It was said that she had one day fallen down and lost her sight; subsequently she

had headache and was occasionally sick. She first came as an out-patient under Dr. Pye-Smith on account of her failing powers both of mind and body. Those who casually saw her believed she was an idiot. She afterwards came into the hospital, where she lay two or three months until her death. Her symptoms were almost entirely of a negative character; she had ceased to be able to stand, and had very little power in moving her legs. Her arms she moved but feebly and slowly. She had a vacant stare, with dilated pupils. She generally lay quiet, making no complaints, and when spoken to smiled. When asked her name or a simple question she answered sensibly but remarkably slowly, so that it was not apparent for some time whether she understood the question and was able to express herself. It evidently took her a long time, and caused her a great effort to collect her thoughts. The only difference perceived from week to week was that the bodily and mental powers grew feebler. As regards the former she had no paralysis in the usual acceptation of the term, but she failed in the ability to attempt any movement. When food was put in her mouth she would cease chewing and swallowing so that it would remain in her mouth until removed. She could evidently see, and on examination by the ophthalmoscope nothing abnormal was discovered in the retina. The skin appeared sensitive as far as could be ascertained. During the last few days of her life she lay with her eyes open; she looked at the nurse, but could no longer speak, although by a movement of the lips she appeared as if endeavouring to do so. She then became cold and her feet very livid, and so quietly died.

The diagnosis in such a case was difficult. There was nothing to warrant any other opinion than that the brain as a whole or the hemispheres were at fault. As, however, many cases have occurred where the whole brain has been affected in connection with a tumour either functionally in a reflex manner or organically by a secondary inflammation, especially of the ventricles, it was thought possible that a tumour might exist in the hemispheres or cerebellum. There was, however, an absence of the usual symptoms of this condition, viz. fits, violent headache, frequent sickness, and optic neuritis.

The *post-mortem examination* showed a general meningocerebritis. No tubercles were discoverable in the brain or any

part of the body. The character of the inflammation was not of the kind seen in tubercular meningitis. The whole surface of the brain had lost its transparency, the arachnoid was thick and opaque, and in the meshes of the pia mater was a considerable quantity of serous fluid, which escaped when this membrane was torn. There was, however, also some exudation of a firmer character. This appearance was universal, but rather more on the surface than at the base. The ventricles were very greatly distended with a clear fluid; no signs of any inflammatory action, except in the fourth ventricle, which was slightly granular. The brain as a whole was firmer than is usual twenty-four hours after death; it felt hard to the finger, and the septum lucidum could be stretched out firmly without lacerating it. No tumours nor morbid deposits in any part. The most striking morbid condition was the firm adhesion of the pia mater to the surface; in spite of the presence of fluid it was difficult to remove this membrane from any part, as an attempt to do so tore away some of the convolution. This was more especially the case with the outer cortical layer of the grey substance, which came off together with the pia mater, so that the latter when removed was covered with a thin granular layer of cerebral matter. This condition reminded me very much of the similar fact on attempting to tear the capsule from a granular kidney. The bones of the skull were perfectly healthy, nor did there appear any cause for the occurrence of this general chronic inflammation of the membranes and substance of the brain.

CASE. Ventricular effusion.—A young man, *æt.* 23, an engineer, was said to have had good health until a year before he came under my care, when he began to have strange feelings in his limbs. Whilst at work he would be obliged to stop suddenly, but without losing consciousness, and once he stood a whole hour without moving. Later on he had fits in which he lost his consciousness. We were struck by his large head and cerebral aspect; he had a vacant look and slight strabismus. When spoken to he answered slowly and coherently, but it was found that his statements were often incorrect. He had general muscular debility, moved his arms slowly, and had difficulty in chewing his food; he passed his

urine in bed, but whether this was due to actual paralysis or not was uncertain. The pupils were dilated and the optic discs ill defined, and some hæmorrhage into the retina had occurred. He remained a few days in this condition, indicating an extreme feebleness of body and mind, when he had a fit and died.

The post-mortem examination was made by Dr. Fagge. The body was well nourished and muscular. The bones of the skull were exceedingly thin, having no diploë as in a child's skull; the dura mater was easily removed. The brain was flattened owing to the presence of a large quantity of fluid in the ventricles; this was clear and scarcely altered by boiling. The ependyma was thick, and in places granular; all the ventricles were dilated; the third formed a wide, cyst-like expansion at the base of the brain, over which the optic nerves were stretched. The *iter a tertio ad quartum ventriculum* was large enough to admit a pencil. The fourth ventricle was enlarged so as to excavate the cerebellum; the medulla oblongata looked soft, but showed no very evident disease. The cord was firm and healthy.

CASE. *Ventricular effusion*.—A man of middle age was brought to the hospital in a fit. After the paroxysm was over he lay in a drowsy state with a slow labouring pulse, so that it was thought he was suffering from a concussion of the brain, as he had had a violent blow on the head. It was learned that he had had several fits previously. Also that he had had a severe fall on his head some years before, but it was not known that he had any cerebral symptoms following it. He never got out of his drowsy state, but remained lying quietly in bed until his death. His pulse was very slow, sometimes 40 per minute, but he had no fits nor any other marked cerebral symptoms. After death an old fracture of the skull was found at its posterior part and base. The brain appeared structurally healthy, but the ventricles contained fourteen ounces of fluid. This was of the ordinary natural kind, and showed no evidence of its having had an inflammatory origin, and there was no apparent obstruction in the veins of Galen or in the fourth ventricle.

CASE. *Tumour*.—A man was admitted at the early part of this year on account of pains at the back of the head in the

course of the occipital nerve. After some time his manner appeared strange, and he became very morose; he then ceased to walk about, and sat quiet in a chair all day in a lethargic state. He subsequently took to his bed and remained lying there in a simply passive state till he died. He had no paralysis, and except the pain at the early part of the illness, his only symptom was a gradually increasing dementia.

On post-mortem examination there was found a tumour the size of an egg in the anterior lobe of the left hemisphere. It occupied the medullary matter and the convolutions were stretched over it.

HYSTERIA AND ARREST OF CEREBRAL ACTION.

In the preceding cases of cerebritis it has been said that, although the whole brain was affected, and the disease was accompanied as a necessary result by a failure of mental power, yet in all of them an opinion had been expressed that the patients might have been suffering from a mere temporary or functional malady. It may seem strange that a so utterly erroneous diagnosis could have been maintained, but on consideration it is seen to be owing to the absence of any of those special symptoms which at once denote disease of some distinctive part of the brain machinery; the organ in these cases simply ceasing to act as a whole. It would be much the same, I apprehend, in the case of a watch or steam engine in which we might find a fault in its mechanism whilst it was in motion, but if at a standstill and enclosed in a case it would be extremely difficult to say whether its inability to work was due to a derangement of the machinery or was merely owing to a want of steam or spring power. If two watches were lying on the table and motionless, it would be impossible to decide without any further knowledge which was quiet as a result of a broken spring and which as a result of not being wound up. It is the fact of these negative symptoms which makes the diseases of the nervous system so difficult to diagnose, there being scarcely a single organic disease which is not simulated by a functional

one. It seems, indeed, to be absolutely true that the machinery of the nervous centres may actually cease working or functioning, and thus, like the unwound-up watch, be for all active purposes diseased or dead.

We have been in the habit of endeavouring to force all our cases into a given category of pathological changes, and then to speculate to which in the list any one of them appertains. And in this matter fashion to a certain extent guides us, for as formerly inflammations and congestions were regarded as the most probable cause of disturbance of the cerebro-spinal centres, so now, on the other hand, anæmia, brought about by the action of the vaso-motor nerves, has taken their place. There is no proof that either one or the other of these blood changes is instrumental in the production of conditions where the centres temporarily cease to act; nor is it likely that in any such aberrant affections implying rapid oscillations in the nerve elements any alterations could have occurred which are conceivable by the mind's microscopic eye. For my own part, I at present rest upon the fact that any part of the nerve centres may cease to work and be productive of the same symptoms as if an organic disease were present; also that such inaction may remain for an indefinite time, and may ultimately lead to changes which may be visible after death. Very often these temporarily dormant states may be rapidly recovered from unless death occur through the paralysing of some vital part, but then no visible disease is found in the nerve centres; nor is it likely that any of the ordinary degenerative processes would be discovered in them.

One cannot in considering these cases fail to remember the fact of the close dependence of the parts of the cerebral centres upon one another—how nerve fibres receive nutritive influence from the grey cells with which they are connected, and how the integrity of the former depends upon the health of the latter; also how any given tract of the spinal cord appears to maintain its activity by other means than by a direct supply of blood. This fact has already suggested a method of discovering the anatomical course of nerve tracts by injuring one portion of them and tracing the effects to a distance. In the case of disease, too, as in extravasation in the corpus striatum, a line of degeneration may be traced downwards through the cord, and some-

times upwards through the corona radiata to the convolutions above. In these instances I apprehend that long before any visible change is seen in the distant part, a deprivation of the nutritive influence may have affected its function and rendered it useless, so that in all probability there was a time when a portion of grey structure presenting no peculiar features to the eye had yet during life ceased to work. These cases, too, tend to explain why in some of the more rapidly spreading disorders of the cord the symptoms denote that the disturbances have run in given tracts.

One of the commonest examples of a disorder of the cord where we can scarcely conceive the occurrence of any of the ordinarily known morbid changes is infantile paralysis. A child may be taken almost suddenly, or after a slight feverish attack, with a loss of power of two or three of his limbs; he may be found perfectly paralysed, yet in a few days he may have perfectly recovered except in one of the limbs which remains permanently weak, ceases to grow like the others, while its muscles become atrophied or contracted. At some far distant time if the spinal cord were examined in this case a wasting or cicatrix might be found in the anterior cornu of the grey matter at that spot where arise the motor nerves of the limb. Consequently we are obliged to conclude that the primary cause for the paralysis existed in those grey cells, but as the change which occurred in them was one which was so rapidly removable, we cannot conceive that any of those morbid states with which we are familiar were present in the first instance. Then, again, there is the disease in adults called acute ascending paralysis, which has been known to be fatal in forty-eight hours, no alterations in the spinal cord being discovered after death. In these cases the disease kills by paralysing the chest, but if it stops short in the lower dorsal region a perfect recovery may ensue. Where in apparently similar cases death has occurred months afterwards, and a marked degeneration of the cord been found, there is no reason why their pathology should not have been in the first instance the same as those which recover. It must be remembered that in long-standing fatal organic diseases of the brain and cord the causes which give rise to them might have been slight and the changes at first of an almost imperceptible kind, as in a remarkable case which once

happened to me in the person of a railway porter, who received an injury from a fall whilst at work. He at the time of the occurrence must have had a slight concussion of the cord, for he experienced strange sensations and feebleness in his legs, but he soon resumed his work, and remained well until three days afterwards, when, whilst walking down the High Street, he suddenly fell; he was picked up and immediately brought to the hospital, where he was found to have a complete paraplegia. He never recovered in the slightest degree, but died after some weeks with softening of the whole length of the cord.

The same causes which are in operation to produce infantile paralysis or those forms of paraplegia which are quickly recoverable may affect a higher part of the cord or the medulla, and then we should have all the symptoms of bulbar paralysis. I have now seen several of these cases; in some the affection has come on slowly, but in many very rapidly, exactly as in the paralysis just named; it may have been confined to the medulla oblongata or extended to the cord below. The symptoms have shown great variation, suggesting a constant oscillation in the activity of the ganglionic cells. I shall presently relate two cases where no evidence of organic change was present; in the fatal one nothing was found, and in the other the rapidity of the progress of the symptoms, together with their equally rapid disappearance, precluded the idea of any structural change.

In the cases I have named, viz. acute recoverable paraplegia, recoverable infantile paralysis, and recoverable bulbar paralysis, we have probably identical affections varying only with the seat in the grey centres, and we may meet in like manner with affections of other parts of the cord equally recoverable, as locomotor ataxia and various forms of paraplegia, especially that arising from the effects of alcohol. There is no disease, in fact, of the cerebro-spinal centres having an organic cause which may not be simulated by a functional one. Even in the cases which recover, if we introduce such a cause as inflammation and the effects of pressure, our difficulty of understanding how loss of function occurs without destruction of tissue still remains. For example, every one must have seen in cases of fatal paraplegia resulting from caries of the spine a mass of lymph pressing on the cord, which therefore must be regarded as the cause of the paralysis in those cases which recover. Thus

I have seen more than one patient lying in bed for many months with angular curvature and complete paraplegia, accompanied by bed sore and constant need of catheterism, eventually get perfectly well; whence it follows that the new product surrounding and squeezing the cord must have arrested its action without in any way injuring its structure. In what manner it did this is not known. It might be by squeezing the tubules and deranging their elements, but whether this could have been made apparent to the eye is very uncertain. The nature of the difference between a cord in action and one at rest is as difficult to conceive as that between a simple wire and another in a state of electric tension; we only know they are not identically the same by the difference of the phenomena which they exhibit, and for the sake of an expression we style these unknown functional conditions dynamic.

In hysteria with profound torpor and an inability to move the limbs, together with an insensibility to every impression, the condition of the patient is not very different from that of sleep. In sleep volitional power has gone, the limbs are flaccid, and receptivity from the outer world has ceased. In this natural period of existence the brain is supplied with a less amount of blood than when it is in full activity, and therefore it might be surmised that certain variations in the amount might be connected with the loss of function in the hysteric state; of this, however, there is no proof. I allude to it because no explanation has been offered of a sudden paraplegia, quickly recoverable or fatal, except by some diminution of blood supply through the action of the vaso-motor nerves. If this were the case the spinal cord would sleep, an idea quite in accord with the commonly expressed doctrine that the spinal system never sleeps, implying that sleep signifies paralysis and death. Because during the inactivity of the brain there is less blood, it does not follow that this diminution is the first stage towards sleep, as it may be a consequence only, more subtle causes being behind it. So in the spinal cord it may be that less blood is flowing through it in some forms of spinal paralysis, but this perhaps is only one of the phenomena of spinal sleep. Whether this be so or not, sleep of the cord would denote a condition of the direst import.

Now, it would appear that the higher ganglia or cerebral

hemispheres may cease to act, as in sleep, and yet be structurally intact. It is in consequence of this that the difficulties mentioned in the cases of cerebritis arose, and patients with a universal disease of the hemispheres were thought to have no worse a malady than hysteria. The most intelligible and best known cause for a cessation of cerebral action is anæmia, or want of blood, as witnessed in the unconsciousness of sleep, of fainting, or in Sir Astley Cooper's experiments, where insensibility was instantaneously produced by a ligature of the blood-vessels. There are other and unknown circumstances which also arrest the activity of the brain or paralyse it; one of these may be a violent moral shock, and as a consequence all the higher functions connected with the superior cerebral ganglia disappear, and the patient lies senseless, without volition, the animal and spinal part being alone in operation. This complete abeyance of the supreme functions of the nervous system is one of the most characteristic features of hysteria; so much so that where no one has yet succeeded in giving a definition of the disease, this inaction of the cerebral hemispheres leaving the spinal system to have its full play gives as good and correct idea of its nature as any other definition. It is clear that the possessor of a very powerful will or authoritative disposition could not be hysterical except under the influence of a tremendous shock to the system, whilst on the other hand hysteria would be constantly found amongst the nervous and feeble-minded. It approaches therefore in many cases to actual insanity, which in itself is often nothing more than a loss of control over the lower animal instincts and passions; in fact, a definition of insanity has been founded on the loss of will power, and that it is rather this than an absence of intelligence which is so often seen in lunatics. It is exactly on this point that members of the medical and legal professions differ. Coleridge saw that the will could be separated from the understanding, for in allusion to his own melancholy addiction to opium eating, he says, "My case is a species of madness, only that it is a derangement, an utter impotence of volition, and not of the intellectual faculties." Certain it is that in many forms of hysteria the prominent condition is one in which the higher mental faculties have ceased to control the lower, and the spinal system is in full play. In hysterical attacks with

convulsive movements one is reminded of the wriggling of an animal without a head; in other cases the patient lies in a state of torpor; all perception has gone as well as volition; if this condition becomes chronic, a state of trance ensues, in which the patient is brought to the lowest state of vitality, and resembles in many respects, and especially from the small amount of food which is required, a hibernating animal. We cannot therefore but conclude that when an hysterical woman is anæsthetic and paraplegic, her brain has lost its activity. She does not feel, she does not move, the cerebral powers are dormant. If this be so, what other conclusion can be arrived at in cases of hemiplegia and hemianæsthesia of an hysterical or ideal nature than that one hemisphere has become inactive or ceased to work whilst the other is in full operation?

If we suppose that in the act of volition the hemispheres give the command, as it were, to the lower spinal centres to work, or if in any other way the connection between the two be so intimate that an inaction in the convolutions implies a corresponding inertness in all parts below on the corresponding side, it is clear that a general suspension of the powers of one hemisphere would produce a complete powerlessness in the whole train of its connection below. A hemiplegia indeed would result, although very different from the more ordinary form which has its seat in a spinal centre; it would follow no defined anatomical course, and would thus be readily recognisable. We should find that the patient could not move her arm or leg on one side, she would have a difficulty in raising the eyelid, in opening the mouth, in protruding the tongue, in urinating or defecating. In hysteria there would be no strabismus, the face would not be drawn up, since a facial paralysis could not be simulated, nor would there be paralysis of the orbicularis of the eye or mouth.

It is clear in such a case that the spinal system is not at fault but the will of the patient, and therefore we are obliged to place the seat of the complaint in the cerebral hemisphere of one side. But if we suppose that the whole of the cerebral hemisphere is in a state of torpor, we should expect that a loss of perception might accompany the loss of volition, and if so, that it would include a loss of the whole of the senses. Now, it so happens that the hemianæsthesia is of this character and

is most complete, obliging us to carry the cause of it out of the spinal system ; indeed, there is no spot in the course of the sensory tract which could include in its functions the whole of those which we sometimes see disordered in this form of paralysis. If the case were one of simple hemianæsthesia only, a difficulty would even then exist in finding a locality for it, as opinions still differ amongst physicians as to where the sensory nerves terminate. For although physiologists trace them to the thalamus opticus, it is not a common observation that disease in this organ produces anæsthesia. Türck and others have by experiments endeavoured to prove that the spot necessary to be injured to produce loss of sensation is situated outside the thalamus, and in the course of the fibres passing from it to the convolutions beyond. Those who have founded their observations, however, on cases of apoplectic effusions are not agreed as to the effects produced by lesions of the thalamus. There can be no doubt that in some cases of hemiplegia a loss of sensation accompanies loss of motion, and therefore there must be some fibres used for sensory purposes which pass from the central ganglia to the hemispheres. In these cases, however, the extent of the loss of sensation has not been accurately measured, but it seems to be much more widely diffused than the corresponding loss of motion. Whether this can possibly be complete on one side in a case of distinct cerebral lesion has not yet been made out. In the only cases where I have observed it to be complete there has been no evidence of disease in any part of the spinal system, and the case has been clearly functional or one of hysteria. The hemianæsthesia, I say, has been complete, including not only the limbs but one side of the trunk as far as the median line, and the face also ; half of the tongue and the eye on that side being also devoid of feeling ; and added to this, there has been an abolition of the special senses, the patient not being able to hear, see, smell, or taste on the affected side. It follows from this that if we were able to place the seat of common sensation in the neighbourhood of the thalamus, we must include in it a certain portion of the surrounding hemisphere in order to bring in the centres of perception for the other four senses, and we should be obliged to delegate the seat of this complete hemianæsthesia to a certain central region of the hemisphere. Judging, however,

from the fact of the whole perceptive powers being in abeyance, it is much more likely that a larger part of the brain is affected than this, and as hemiplegia so often occurs with it, it is more probable that the whole of the hemisphere is at fault. The only difficulty in accepting this explanation lies in our not seeing why one half of the brain should be affected rather than the whole; but, on the other hand, no other clue to the symptoms seems open, when one has explained that a total abolition of perception and volition arises from a cessation of all cerebral action, than to consider that similar symptoms affecting half of the body arise from an arrest of half-brain action. Both the complete and partial forms of complaint are not infrequently seen: as, for example, a girl had a great fright; was placed in bed, where she lay in a perfect state of torpor for some days; she did not move hand or foot; she could bear a pin run into her body, and was insensible to everything around her. The case reminded me of a watch which had had a blow and the machinery had stopped working. Now, if a total inability to move and a complete insensibility to impressions signifies a temporary suspension of the action of the higher ganglia of the brain, then we must regard a hemikinesia and a hemianæsthesia associated with a loss of the special senses on that side as a suspension of power of one hemisphere or a half of the higher cerebral ganglia. I can therefore arrive at no other conclusion than that the girl with these symptoms had only half her brain at work. The amaurosis or amblyopia in hysterical women has long ago attracted notice, and opinions have differed as to its character; according to my observations the blindness has been complete in one eye, and the affection is not one of hemiopia. Sometimes a modified affection is seen in an insensibility to particular colours.

I have already said that I have never seen a perfect loss of sensation involving half of the body due to organic lesion, and, therefore, should not know where to locate the seat of disease in a perfect hemianæsthesia; but even supposing such a seat existed in the thalamus or lower down the sensory strands, we should have to enlarge the area of our lesion to include the special senses, and more still if loss of motion be included in the morbid condition. We are then forced to regard the whole hemisphere as at fault, including the anterior por-

tion connected with volitionary power and the posterior with sensation.¹

When I speak of the cerebral lobes being in abeyance they may be absolutely so for a time and then slightly resume their activity, so that apparently an oscillation between action and inaction is constantly going on. On one day the patient can move her arm slightly and on another she cannot, or, whilst believing the limb is paralysed, a certain amount of resistance may be experienced when it is raised. Just as in the simile of the watch which is stopped by one blow and set in motion again by another, so a sudden rousing of the will will sometimes occur through a shock to the sensorium. A fright will make a woman long bedridden leap from her couch, the sounds of long-forgotten music will sometimes have the same effect, and, in fact, any circumstance which will act on her sensorium may afford the corrective stimulus. Moral treatment is the method eminently rational and successful, whilst that which is too often adopted is a system most perfectly devised to perpetuate the hysterical state. By regarding it as a positive disease and fostering this idea by constant medical attendance, by nursing and the administration of medicine, a mode is adopted exactly suited to convert a functional trouble into a real malady. The speedy cures which occur in hospitals amongst patients who have had nervous maladies of months' and even years' duration contrasts most remarkably with the failure of treatment in like cases in private practice.

The theory which ascribes the complete abeyance of the will and of sensation in hysteria to a cessation of the activity of the higher functions of the cerebral hemispheres is quite in accordance with the facts observed in this disease; if we also believe that during the absence of this governing power of the brain the

¹ Professor Benedict has observed in low-typed criminals a failure of the posterior cerebral lobes to cover the cerebellum. The physiological doctrine associating the anterior portion of the brain with motion and volition, and the posterior with sensation, is corroborated by Ferrier's experiments, and if it warrant the conclusion that the intellectual faculties are as much connected with the latter as the former, it is only in harmony with the comparative development of the brain and the observation of physiognomists. We need only look into the pages of the weekly comic journals to see that artists portray weak-minded, foolish men, not by villanous low foreheads, but by an absence of posterior development, whereby the back of the head and the neck are in one plane.

spinal system is allowed to run riot, we can understand the meaning of the convulsions, strange movements, and emotional excesses so frequently witnessed in this malady.

There may be, however, a difficulty in interpreting other symptoms which occasionally occur, as the spasmodic contraction of a limb, and in knowing whether this should be referred to irritation of any part of the spinal system or not.

In any given case it may be a question whether a really active spasmodic state exists or whether the limb may not have simply become contracted from disease; in the case of the legs, if they be stretched out, the feet extended to the utmost and slightly turned in with the tendo Achillis projecting and rigid as in talipes equinus, the paralysis may be regarded as a perfectly passive one; for if a dead and flaccid body were suspended the feet would fall and turn somewhat inwards, just as is seen in hysterical subjects; if this position is long continued a contraction and rigidity of muscles will permanently take place. I have seen a girl with her feet extended in this manner and who was thought to be hopelessly paralysed, walking about a few days after such opinion was formed. As regards the arm and hand, the position they take seems to indicate a more active spasm, for the elbow and wrist are often tightly contracted, or, what is not unfrequently seen, the fingers become extended and formed into a cone. In the form of active spasm known as tetanilla in children this conical extension of the hand is also met with.

I have never seen any spasm or rigidity of this kind where the patient has been unconscious, as we have had an opportunity of proving in two patients lately who were the subjects of hystero-epilepsy. They lay with their eyes shut and resisted any attempts at opening the lids, or of extending the arm, but when they were really asleep the spasmodically contracted limbs became flaccid. This clearly shows that the waking state is intimately associated with the contractility of the muscles, or, to put it in other words, the activity of the cerebral hemispheres is necessary for their due tension. This fact opens up a very important question in nerve physiology, an answer to which would explain a great number of morbid states. It may be remembered in the first place that if the head of an animal be removed, its spinal cord comes into play uncontrolled and a

series of movement occur which can again be combated by a galvanic current passed through the marrow; it may be, therefore, that in hysteria when the higher faculties are apparently in abeyance that a convulsion would necessarily occur, yet, on the other hand, the common observation of all is that when a person becomes unconscious, indicating a cessation of cerebral action, the body becomes powerless and flaccid. When we are asleep our muscles are paralysed, the head falls, the mouth opens, and the soft palate hangs loose.

In epilepsy the loss of consciousness induces a sudden fall. This seems to be the rule and we are then forced to explain the phenomena of catalepsy and somnambulism by modifications or degrees of inactivity. In the latter the condition is one where the senses can be partially acted on, for the sleep-walker seems to make use of his eyes and thus by an excito-motor process is enabled to follow with safety any direction.

His nervous system is acting, but not with sufficient intensity to rouse him into consciousness, and in the cataleptic state he can be played upon as an instrument; the curious circumstance in catalepsy being that the same state of brain which is one of temporary activity during the exertion of the will must apparently continue as a permanent one during a long period of time. Instead of the brain willing to move a limb the organ is excited by placing the limb in position and the cerebral operation still goes on; the muscles being kept in a constrained position much longer than could be attained by an effort of the will.¹ From these and similar cases it is clear that the

¹ It seems strange that while physiologists are dealing with the animal body, and showing how various actions take place through the cognisance of the cerebro-spinal centres, and without any necessary act of consciousness, the metaphysicians are still content to frame all human action and motive on the basis of consciousness, and totally ignore any acquaintance with the body with which all mental operations must be intimately connected. They still seem to hold to the doctrine of Descartes that *existence is consciousness*, and *vice versâ*; at least, that is clearly the meaning usually put upon the words "*cogito ergo sum*." But even now non-scientific men are beginning to see that this is a dogmatic assumption and nothing more. It contains no answer to those who believe consciousness to be a part only of man's existence. Matthew Arnold has a glimpse of this when he says that thinking implies being and existing. It clearly does not follow because *cogito ergo sum* is true that the whole of existence is contained in thinking.

physiological question of the connection between the spinal cord and the cerebral hemispheres is not yet solved, nor what amount of controlling power the one exerts over the other. If we had more knowledge of this we should at once have a clue to many curious pathological states. In the ordinary case of an epileptic fit opinions still differ as to whether the convulsive movements are due to an over-excitation of the cerebral hemispheres or to their sudden arrest of function for the moment unloosening the spring of the spinal system which then begins to act uncontrolled.

The former, however, is the usual explanation, together with the fact that the brain being overcharged or from some vascular cause not being able to retain its nerve forces within it, they escape and produce through the spinal cord the convulsive phenomena with which we are all familiar.

This view is supported by the case of unilateral epilepsy, which is due to a local disease, as a syphilitic gumma, on one side of the brain. In this case it is the irritation produced by the deposit, which disturbs the equilibrium of the hemisphere and allows a discharge and causes the convulsive phenomena. It is worthy of remark that in instances of this kind, as long ago noticed, consciousness may remain, which is another proof in corroboration of the argument before mentioned that the two hemispheres may act independently, and that one may cease its activity without the other. It seems remarkable that a doctrine I have always taught is only just beginning to be perceived—that the formation of an animal body in two halves and with two sets of nerves necessitates the separation of the nerve centres whenever an independent action of the limbs is required. The splitting of the spinal cord is a necessity of this independent action, and from this again necessarily follows a separate cerebral ganglion to rule over each. The mode in which the two sides receiving different impressions can combine them into one is by means of the commissure, and the explanation is, no doubt, of the same kind as that of single vision with two eyes. In the latter case we see more by having two eyes, as we really combine two pictures, and no doubt we obtain more knowledge by combining the perceptions of the two hemispheres of the brain than by one. Consciousness might remain if one was destroyed, but with what de-

triment to the whole body and intellectual state it might require a closer observation to discover.

Although my object has been to enforce the fact that any part of the cerebro-spinal system may slumber, yet it is important, as well as interesting, to observe other morbid states of the nervous system, which are often associated with this condition of torpor. I have already alluded to abnormal movements, and I may direct attention to hyperæsthesia and neuralgia. Where a constant movement exists we suppose that the motor centres are in a state of over-excitation; for example, if I imitate the movements of choreal patients I am exerting an influence on the corpus striatum, and therefore when the action is involuntary it is supposed by many that this ganglion is in a state of perpetual morbid irritation; so, again, if I imitate the tetanic state, I am throwing the motor columns momentarily into an excitation which they permanently assume in real tetanus; this state therefore being clearly a dynamic one. Also those lesser choreal movements which are so common mean nothing more than the perpetual activity of a motor centre, which should only naturally be excited under the power of the will. In some cases the strange movement is not morbid in any sense, it is simply purposeless; for since the grey centres are educated for special useful motions, which they come to perform without the guidance of the will, so they may contract after a time some habitual odd movement; but this cannot be regarded as a disease. If this morbid irritability of the motor centres be allowed, as well as their liability to continue in action beyond the control of the will, there is no difficulty in admitting the possibility of an analogous condition in the sensory centres; if so, a hyperæsthesia would result. If, again, that condition into which the sensory centres are thrown when pain is produced should continue, a neuralgia or subjective pain would result. It is at present a problem beyond our solution to discover into what different state the higher nerve centres are thrown when, on touching the surface of the body, a common sensation or pain is experienced, but we can imagine that if a similar state of susceptibility arise from causes within the centres themselves, then an extreme sensibility or actual pain would be felt as a purely subjective symptom. It is curious, however, to observe how rare is a true hallucination

of feeling; the nervous centres may be morbidly appreciative when the skin is touched, and an actual pain may be experienced when no outward cause for it is present, but the existence of a morbid state productive of a subjective feeling of touch appears to be most uncommon. Feeling, Herbert Spencer says, is the most perfect of the senses, and is that into which the others have to be construed, since they so often deceive us, whilst this one rarely does so; thus it is that children and animals always supplement the knowledge gained through the other senses by touch, and persons who are haunted by the appearance of ghosts rely upon touch as the test of their reality. This is the common experience of mankind, as expressed by our great poet in *Macbeth*, when he sees the vision of the bloody dagger before him. The murderer says, "I see thee yet, in form as palpable as this which now I draw," and, having his mental faculties still clear, applies the test: "Come, let me clutch thee. I have thee not, and yet I see thee still." * * * "Art thou but a dagger of the mind, a false creation, proceeding from the heat-oppressed brain." An older example of the foregoing fact is seen in the case of the doubting apostle. I believe that the sense of touch seldom deceives even in madness or in dreams, the examples to the contrary being rare.¹

An extreme susceptibility of the nerve centres constitutes a form of ordinary neurosis we are daily meeting with, the subjects of it becoming a prey to hyperæsthesia and neuralgia. The whole question of pain from a clinical point of view is one of the greatest importance; indeed, a large part of one's daily occupation is the attempt to unravel the meaning of pain and discover whether it be really objective and have an actual cause in the painful spot or whether it be altogether subjective. As a general principle it may be said that the outside of the body or that which comes in contact with external objects is sensitive whilst the interior is devoid of sensation, that is, injuries to the exterior skin or mucous membrane cause exquisite pain, whilst incisions into the solid viscera or the stomach and

¹ We must make exception, however, to the common rule of mankind in the case of the "spiritualists," who, when convinced of the reality of a spirit standing before them, by discovering that it is firm and warm to the touch, declare that it is a "materialised spirit." How this differs from a common man or woman they have not yet shown.

bowels produce none; and the same is true of the bones and muscles. In disease, however, the case is different; in inflammation of the thoracic and abdominal walls acute pain is experienced, but here branches of the same nerves are involved which supply the skin without. In the case of the solid viscera there is little proof that disease of any kind is felt, but in the hollow organs, as the stomach, intestines, ducts, so also in the muscles, most exquisite pain is felt when a compression of the tissue takes place, or in spasm as it is called. All these painful states are positive and objective, but besides these there are pains which are subjective, or, at least, have not the usual origin, in an irritation of the periphery of the nerve; in many cases of this kind the nerve itself may be at fault, but of this there is no proof.

When we use the term neuralgia we generally imply, on the one hand, that there is an absence of any local cause to produce the pain, and, on the other, that it is not merely subjective, but that there is something abnormal in the nerve itself which is productive of the symptoms. In many cases it is difficult to decide between these three states, one having an ordinary local origin, another due to a morbid state of nerve, and a third a purely subjective condition arising from over-sensitiveness of the centres. It requires all the medical man's acumen to unravel these several causes. The patient himself cannot distinguish between them, and from my own knowledge I am sure that no power of discrimination belongs to us; indeed, to the patient himself there is no difference between his having a pain in a part and thinking he has a pain in that part. In a state of health a man should have no knowledge of the working of his animal machinery, but as soon as he gets out of gear he becomes conscious of his head, his heart, his stomach, and other organs, and moreover he begins to experience aches and pains. He has headache, or backache, pain in the side, or pain in every part of the body. In the condition known as hysteria, there may arise neuralgia, myalgia, enteralgia, and every other algia. In various material diseases the same, however, may be seen, as in poisoning by lead and in alcoholism, where there is not a part of the body in which pain may not be experienced. In some instances of the kind there may be an actual change in the nerve, but in others the cause can only be attributed to a morbidly sensitive state of the centres.

We must conclude that in hysteria and some other conditions whose pathology is not known the cerebro-spinal centres may become dormant, and also that they may, on the other hand, become over-active, giving rise to increased motility or increased sensitiveness.

CASE. *Hemiplegia and hemianæsthesia*.—Mary K—, æt. 24, was admitted under my care last year with what I believed to be a serious disease of the brain. She had been ailing for some time; had had inflammation of the eyes, and the right one had been removed a short time before at a provincial hospital. She had also amenorrhœa, cough, spitting of blood, sickness, and a severe pain in the head. After having been in the ward a few days she complained more of her head, and it was said she was delirious at night; she then began to lose power in her left arm and leg until they became completely paralysed. The question of tumour in the brain was discussed owing to the presence of all these symptoms following removal of the eye, the nature of the disease therein never having been ascertained. Subsequently she had fits in which she foamed at the mouth, and the pain in the head became incessant, so that injections of morphia had to be daily used. My impression then was that she had a tumour in the brain, judging from the combination of symptoms such as pain, fits, sickness, and paralysis. I then left her for some weeks, and when I took charge of her again nearly six months had elapsed since her admission. I now was obliged to alter my view of the case, as the whole of the symptoms were becoming more markedly of a functional or hysterical character. Her head was better, the sickness less, she had grown fatter, and an anæsthesia had become associated with the hemiplegia. The latter also had put on exactly the characters of the hysteric or ideal form. She was now quite unable to move her left arm or left leg, she could not open her mouth to put out her tongue, and her food was squeezed in between her teeth, but there was no falling of the face as seen in paralysis of the facial nerve. The hemianæsthesia was also observed to be complete, there was loss of feeling of the whole of the left side, not only of the limbs but of the trunk as far as the median line, and also of the left side of the face, including the eye and the tongue. The special senses on that side also were

lost; she could not see, hear, taste, or smell on that side. As in many cases of hysteric paralysis, the latter was not complete, for on raising her arm from her side and holding her in conversation, the arm would for a moment remain unsupported. Also as she lay in bed doing needlework with her right hand, the left one lying on the material to steady it, she was seen often to move the fingers of the left side. The eye examined by the ophthalmoscope showed nothing distinctive. The whole appearance of the patient was now totally different from that which she at first presented, and to an experienced eye at once revealed the true nature of the malady. At first she always lay with her head on the pillow, complaining of violent headache and frequent sickness, and looking as if she were really ill; on the next occasion when I took charge of her, although she had all these additional symptoms, she was sitting up, her bed was covered with needlework and flowers, and books were on the locker by her side. Unfortunately the sister of the ward did not take my view of the case, and instead of assisting me in endeavouring to rouse the girl's dormant will sympathised with her, and thus entirely stood in the way of her recovery. I sent her out, but readmitted her after some weeks in exactly the same state; she did not look ill, had grown stout, but had complete hemianæsthesia of the left side of the body together with a hemiplegia characterised by an inability to move the left arm and leg, open the mouth, and protrude the tongue. I failed to obtain the co-operation of the sister of the ward and no improvement took place.

CASE. *Hemiplegia and hemianæsthesia*.—H. A. T—, æt. 22, a Swiss, employed in an equestrian circus. He had often had falls and received various contusions on the body and head. He had been out of his occupation for a fortnight, wandering about the streets and having scarcely anything to eat. On the evening of admission when in a street near the hospital he felt a rush of cold in his right arm; he then shook violently and fell down. He was picked up by the bystanders and brought in within a quarter of an hour after the occurrence. He was pale and motionless and thought to be dead. He was found, however, to be unconscious only, and was put to bed, when within an hour his senses returned; he then related the circumstances

of his attack, and was observed to be in the same condition as I found him a few hours afterwards. He was quite sensible; the right arm was tightly flexed across the chest, the elbow and wrist joints being bent, and the muscles rigid; the hand was turned outwards, the fingers separated, the thumb drawn in, and the little finger tightly flexed, whilst the last phalanges of the other fingers were extended; it thus appeared as if the muscles supplied by the ulnar nerve were especially in action. The foot was extended and the muscles contracted; he could stand on the limb but moved it as if it was a wooden one. There was no apparent paralysis of the face, but he said he could not whistle. Besides this spasmodic contraction of the right limbs he had almost complete anæsthesia of the same side; he could not feel when touched, nor discern hot from cold. This loss of feeling included the whole of the right side of the face with the eye and nose and the trunk as well as the extremities; he had lost also the senses of smell, taste, and hearing on that side. He said he had a pain in the right temple and forehead; on testing with both forms of galvanism it was found that the muscles did not react so well as on the healthy side.

At the end of a week the sensation was returning in the face and body, but was still very imperfect in the limbs where the rigidity still remained; hearing and taste had returned. He still gradually improved, and at the end of another week he could extend all his fingers but the ring finger, and the little finger still remained flexed. The leg was weak though he could walk with it. Sensation was still impaired. About this time he was said to have had a fit in the night, when it was observed by the house-physician that the whole of his original symptoms had returned, including the rigidity and anæsthesia, but on the following day he was as well as before the attack. Two days after, he left the hospital surreptitiously with some of his neighbour's clothes, thus confirming the suspicion formed from the young man's own history and general demeanour that he was thoroughly depraved and vicious.

The diagnosis lay here between two very different forms of complaint. One hemisphere was clearly *hors de combat*; was this purely functional and his case one which would have been called hysteria in a woman, or was there effusion of blood on the surface of the hemisphere? The latter would account for

all the symptoms—the want of power of movement and hemi-anæsthesia with the spasm due to the irritation of the surface.

BULBAR PARALYSIS, ORGANIC AND FUNCTIONAL.

I record the accompanying cases as further illustrative of the disease known as bulbar paralysis; the first one as another instance to be added to those already described of the association of this form of malady with that called progressive muscular atrophy. In a former paper on labio-glosso-laryngeal paralysis¹ I recorded a good instance of this combination which now appears to be not uncommon, the two diseases together being, in fact, a single pathological process extending over a large area.

It seems that amongst other morbid states liable to arise in the cord without any well-known cause is one which involves the anterior or motor cornua of the grey matter, and that as a consequence a motor paralysis is produced which is again followed by an atrophy of the muscles. Another theory, however, exists in explanation of these several morbid phenomena, and that is that the wasting of the muscles is the first factor in the process, and therefore that the disease known as progressive muscular atrophy is a myopathia and not a neuropathia. The pathological facts are agreed upon by all, but the more correct observations of late are leading most to the belief that the disease is a primary one of the cord. Cruveilhier, who first thoroughly described the disease, was well acquainted with the atrophy of the motor nerves and of the anterior portion of the cord whence they emanated, but he believed this condition was secondary to the atrophy of the muscle. This view is still supported by one of the most voluminous writers on the subject, Friedreich, but in spite of his advocacy the cases given in this work by Sir W. Gull, and those by Virchow and Lockhart Clarke elsewhere, are sufficient to prove that the disease is primarily a central one. There is now much to corroborate this view in cases of infantile paralysis and other

¹ 'Guy's Hospital Reports,' vol. xv, 1869-70, p. 8.

forms of palsy where the cause is clearly spinal. This, however, does not preclude the opinion as to the existence of such an affection as local atrophy of the muscles. It is worthy of notice that the disease of which we are speaking usually occurs in the lower cervical region, so that the arms are the parts primarily affected. Now in labio-glosso-laryngeal or bulbar paralysis we find a similar change in the higher part of the medulla just as in the cervical part in this; that is, in the motor tract corresponding to the origin of the seventh, eighth, and ninth nerves.

Now, it is merely an extension of disease from this tract of motor cells above to those below which constitutes the not unfrequent combination of which I speak. In the bulbar paralysis the disease is situated in the central raphé in the fourth ventricle, its principal seat being, as in the former case which I published, at the point of the calamus scriptorius. In fatal cases degeneration of the grey cells and the tissue surrounding them has been found to have taken place.

One cannot avoid remarking in considering this intimate association between the nutrition of the nerve and the muscle to which it passes, the correlative facts deduced by Ferrier's experiments. In these there appears to be shown the closest intimacy between the surface of the body and the perceptive portions of the brain and also between every muscular fibre and the motor portions of this organ. In pathology we find similar facts observable. These I have mentioned in progressive muscular atrophy, also the corresponding fact of the relation between given tracts in the cord; how, for example, a spot of disease will extend downwards from the corpus striatum along the motor columns, or advance upwards through the radiated fibres to the convolutions over it; so that corresponding depressions may be observed on the surface of the brain and the ganglia below. We may, therefore, see by experiments made for us in disease that the connection is one of the most intimate nature between the convolutions above, and the muscular fibrillæ at the other end of the nervous apparatus. Since every muscular fibre has its own nerve twig and the compound nerve in the limb has a wide origin, it is not unreasonable to suppose that every fibre of the muscle is represented by a grey cell in the nerve centres. If this be the case the difficulty of explaining how a small fasciculus of a muscle can owe its wasting to a

central nerve cause, is removed. If we take cases of coarse disease such as paralysis and atrophy of whole limbs occurring in childhood, then a corresponding wasting of the opposite side of the brain has often been noticed.¹

I think it well that many of these nervous diseases have names derived from their clinical features rather than from their supposed pathological causes, and I believe it were better if all nomenclature had merely a clinical basis. We should then all recognise the affection of which we are speaking, and room would be left to investigate its pathology afterwards. Now, as regards labio-glosso-laryngeal paralysis, Cruveilhier's paralysis, infantile paralysis, acute ascending paralysis, and other forms, physiology informs us what particular part of the cord is affected in each particular case, but how it is affected is for the pathologist to discover. In some cases the changes are of the rougher kind known as inflammatory, leading to degenerations or hardenings, and are more rarely due to blood effusions, occasionally to syphilis and morbid growths, whilst in the majority of instances the alteration is probably one of a sudden and primary character, whose cause is not yet made out. In the case of infantile paralysis several limbs may very quickly become paralysed and as quickly recover themselves, leaving one, perhaps, permanently weak. If opportunity for examining the cord occur some atrophic changes may be found in the part corresponding to the origin of the nerves of the limb, but this throws no light upon what the primary changes in the cells were which led to this, and which were capable of being recovered from. In some rapidly fatal cases of ascending paralysis no visible alterations are apparent, nor could we expect to find them in any case where complete recovery was as possible as a fatal issue, the latter occurring only through the paralysis of some vital part. The same may be said of bulbar paralysis: the affection may come on very quickly as if an almost sudden arrest of function had taken place in certain cells; in the course of time a degeneration may be found in

¹ It were an invidious task to make comparative estimates of the intellectual and moral character of persons having some physical defect, but if this is associated with a corresponding peculiarity in the brain, it is not unlikely that some obliquity in their character might also occur. I have some good reasons to think this is the case.

them, but I cannot think that in the first instance any well-known cause can be in operation since a perfect or partial recovery is possible. The latter is not uncommon, and as regards complete recovery, I am about to record a case where there could be no doubt that a sudden polar change had occurred in the upper part of the cord, and the case was nearly approaching a fatal end when a sudden restoration to a healthy state took place. I shall also mention another case in a girl which was of some duration, and was eventually fatal, but where no morbid change was found in the cord. My theory is, as before mentioned, that none of the known pathological changes occur, but that the spinal cord sleeps or is in a dormant state corresponding either to the natural sleep of the individual or to what is seen in hysteria. In sleep the brain is not diseased but inactive; so it is in the hysteric trance, and the spinal cord seems able to assume an analogous condition. If a vital part of the cord sleeps death ensues, but no morbid change would be found. If a non-vital part sleeps recovery may rapidly occur without any ill consequences. If not, a permanent paralysis of a part may remain, together with a corresponding wasting of the grey centre which rules over it, but how these weakened parts are associated as cause and effect is not always clear.

I should say that although I select these well-marked cases of bulbar disease for the sake of description they are not always so clearly defined, and they may be only a part of better known coarser changes; thus, bulbar paralysis may be added to various diseases of the cord, and in a case I shall give below, all the symptoms of this affection came on whilst the patient was suffering from hemiplegia and contraction of the limbs. This, I presume, was due to an extension of the disease downwards from the corpus striatum. I believed that this had already taken place when the rigidity of the arm was observed, and that subsequently when the speech and swallowing were affected, the degenerative process advancing along the lateral columns had diverged towards the centres so as to involve the origin of the bulbar nerves.

CASE. *Bulbar paralysis with muscular atrophy.*—Mary Ann B—, æt. 22, a married woman. Was well until three months

before admission when she had some attacks of a very peculiar nature. Her husband said he found her speechless and her right side weak ; after some time she recovered, and remained well until the day before admission, when she was seized in the night with convulsive movements and again lost the power of speech. She appeared a well-grown healthy woman ; she was quite conscious but unable to speak ; the left arm, leg, and side of face appeared partially paralysed and the sensibility exalted, and she could scarcely swallow. For a whole month she lay in bed in a lethargic state as if asleep ; when roused she would open her eyes and look at persons intelligently. When the left arm and leg were moved she would show indications of pain. The respiration was irregular, and often interrupted by a deep sigh. After this time she began to improve, became more sensible, smiled when spoken to, and appeared to understand what was said to her. There was some power of movement in the left leg, but none in the arm, which was beginning to waste. She was soon able to leave her bed, and could walk with assistance. This improvement did not last long before she sank back into her original condition, took to her bed, and for two months did little more than lie there and vegetate. When shaken and roused she would open her eyes and smile, but never articulated a single word ; her face was perfectly expressionless, excepting during emotion, when it was slightly drawn up on one side. Her difficulty of swallowing was so great that much care was obliged to be taken to prevent her choking, and the saliva was continually flowing from her mouth. On raising her right arm it would remain in any position in which it was placed, as in the cataleptic state. The left arm was flexed across the chest and much wasted. The muscles responded to faradization, which gave her no pain, judging from the smile which she put on during the process. The legs were drawn up on pricking them. She seemed then to be slowly getting worse, the breathing became irregular and mostly diaphragmatic, and of a character which suggested not so much that the thoracic muscles were paralysed as that the diaphragm was inordinately excited to contraction. After lying in a very precarious state for some days she again got better, was roused out of her lethargy more easily, smiled when spoken to, and made strange noises in her larynx when

requested to speak. She also moved her left arm slightly and her other limbs more freely. The improvement went on, she grew stouter, looked fresh in the face, and was soon able to walk about the ward. She had now been in the hospital more than six months, and her condition in other respects was as follows:—She could walk slowly, but was very liable to fall; she could move freely the right arm, the left being drawn across the chest and atrophied; there was but little power in it. Her head fell forward and a little to one side. She appeared perfectly intelligent, and responded by movements to everything desired, but could not utter the slightest sound. She could make no effort to cough, but when made to laugh by joking her the mouth would be raised on one side, and she would make a crowing sound evidently from a partial paralysis of the glottis during inspiration. She could only partially open her mouth, and could not protrude her tongue; the latter appeared small. There was no loss of sensibility in any part of the face or limbs. She then left to return home.

CASE. *Acute Glosso-labio-laryngeal Paralysis.*—Cured. —(Reported by Mr. JOHN TALBOT BRETT.)—Thomas H—, æt. 43, admitted Nov. 29, 1876.

History.—Occupation, cabdriver (four-wheeler). Family history good; no hereditary tendency to any nervous affection, rheumatism or gout; his mother, and one brother and one sister, are still living and healthy. Personal history.—A single man; confesses to have drunk a fair amount both of spirits and beer, of the latter principally, and there is some question as to his having had syphilis. He has never had rheumatic or scarlet fever, nor suffered from diphtheria, quinsy, or any other affection; has had no fits of any kind, nor any other kind of nervous derangement, before the present attack. He, however, is very subject to facial erysipelas, having had several attacks, and is now recovering from the fourth. The present attack came on suddenly four days ago, last Saturday morning, when he was seized with a fit, which seems to have been of a hemiplegic character. His brother-in-law states that the patient was standing in ordinary health, with the exception of the erysipelas, before a looking-glass, dressing the rash on his forehead with some ointment, when he was seen to become suddenly rigidly fixed

in one position, his left arm and hand raised as in the action of touching his forehead; thus he remained for about half a minute, never falling or losing his consciousness: he was then conveyed to his bed, when it was discovered that the whole of his left side was in a state of tonic spasm; in half an hour it relaxed, and the whole of the left side remained weakened; nothing was noticed as to a dropping of one side of the face, nor any alteration in his speech. He continued in this state in bed until Monday, when a like weakness was experienced on the right side, and in the afternoon of that day his friends noticed a thickness and incoherence in his speech, a sputtering on his attempting to swallow, and an inability to prevent his saliva trickling out at the left corner of his mouth. These symptoms have remained, slightly increasing, especially those of paralysis of the tongue, &c.; and since yesterday morning his friends say that he has been snoring even when awake. He has remained in bed up to his admission. He has never had any convulsions, nor did he lose his consciousness at any time, having complete control over his sphincters. There is some improvement, he thinks, in his legs since yesterday.

On admission.—Patient is a heavily-built, thick-set man, short-necked, well-nourished, his muscles firm and general appearance fairly healthy. His face is perfectly expressionless, the mouth slightly open and its corners depressed. He lies flat on his back, almost motionless, requiring assistance even to shift his position or turn himself in bed. The forehead and cheeks are congested generally, and covered with a dry yellowish layer of scabs readily detached, the remains of old erysipelatous eruption.

Eyes.—Commencing arcus senilis along the borders of the upper zone of both eyes; conjunctivæ dull, pupils both minutely contracted, especially that of the right side, and acting only indifferently to light.

Tongue.—Large and flabby, rather furred, and covered with the remains of unswallowed food; he can protrude it but slightly, never thrusting its tip beyond the level of the teeth; he cannot touch the roof of his mouth with it, nor curl the tip up on itself.

Fauces.—The soft palate hangs motionless at the back of the mouth; it is flabby and covered with a glairy mucus and

remains of food. He feels when it is touched with a quill, but sensibility seems diminished, and no amount of tickling causes any reflex contraction.

Deglutition is affected ; on introducing the beak of a " feeder " into his mouth, the lips grasp it loosely, but badly adjusting themselves to its shape. When a small quantity of food is placed in his mouth he makes every effort to masticate it ; but it collects between the gums and the cheek, the buccinators not acting, and he is obliged to have fluid to wash his mouth out and get the food down. On placing food at the back of the mouth no such great difficulty in swallowing is experienced. There is frequent dribbling of saliva from the corners of his mouth, and he keeps his pocket-handkerchief in constant readiness to catch it. No nausea or vomiting. Bowels confined.

Organs of Respiration.—*Voice* guttural, jerky, and indistinct. When asked to *cough* he makes only the faintest sound, quite unlike the natural cough. The respiration is chiefly abdominal and diaphragmatic, the walls of the chest moving but little even in deep inspiration. Respiratory rhythm jerky, 24. Physical signs of the chest fairly healthy. At each respiration a sonorous stertorous sound is produced in the throat, and on examining the soft palate on forced breathing merely a wavy motion is seen in it.

Organs of Circulation.—Heart normal ; pulse 70, full.

Liver enlarged to two inches below the edge of the ribs.

Urine.—Acid, sp. gr. 1020 ; free from albumen and sugar.

Nervous System.—Intellect clear ; he understands everything said to him, and all that goes on around. His eyesight is as good as ever and unaffected by the minute contraction of the pupils.

Speech thickened and incoherent ; in attempting to speak he moves his lower lip only, the upper remaining motionless. On putting him through the alphabet he can pronounce fairly distinctly all the letters but o and u, k, l, m, n, s, r, x, and z. On being asked if he knows where he is, he replies immediately and fairly distinctly " Guy's Hospital," though he cannot pronounce his own name so as to be understood.

Movement.—He moves all the muscles of the face, though those of the lower half only indifferently ; he can distend his

cheeks a little, and can manage to blow out a match, though he cannot whistle. The muscles of the neck seem unaffected, he uses his sterno-mastoid, rolling his head from side to side, but cannot manage to raise it from the pillow. The thoracic muscles act but sluggishly, the ribs moving only in a very limited manner. Both arms are very weak in action, he can raise them slowly above his head, flex and rotate the forearm, but cannot grasp anything firmly. The abdominal muscles seem unaffected, and he has complete control over his sphincters. He can raise both legs easily and sharply from the bed, but cannot stand or even support himself when propped up, his legs giving way.

Sensation is perfect over the face, limbs, and body.

Taste is perfect, acid and bitter being recognised over the whole region of the tongue. No pain or tenderness anywhere, and no marked anæsthesia. Temp. 99·2°; pulse 70; resp. 24. Ordered M. M. cum M. S. ʒiiss statim; milk, beef-tea, 3 eggs, finely minced meat, brandy ʒiv.

Dec. 1st.—Patient in endeavouring to shift his position during the night rolled off the spring bed on to the floor, without hurting himself, however. This morning seems better; he moves his arms freely, and can raise his head from the pillow. He can manage to-day all the letters but u, l, s, r, and x. His swallowing is still difficult, requiring careful and slow feeding.

2nd.—The same improvement continues. His grasp is firmer and articulation more distinct; he can now pronounce the u, l, s, and x with deliberation. His breathing was thought by Dr. Wilks yesterday to be carried on without the aid of his diaphragm, but to-day that muscle is acting well. Ordered Pot. Iod. gr. x; Aq. Cinnam. ʒj t. d. s.

4th.—Still further improvement can be recorded. He can raise himself to the sitting posture in bed, moving all his limbs fairly well. His articulation is likewise better, and he can manage to swallow with less difficulty. He takes plenty of nourishment—thanks to the nurse's careful feeding, and his continual cry is for something solid to eat, as he feels quite "peckish." He can protrude his tongue to some distance beyond the teeth, and can move it in all directions.

11th.—Has been continuing to progress in every respect. His appetite is good, and he eats largely, feeding himself,

though advised to do so with caution and slowly. His articulation is now so far distinct as to be easily understood; and this is not entirely due to our getting accustomed to his voice and method of speaking, for he can go all through the alphabet well now with the old exception of the r and s. His soft palate moves now both on inspiration and reflex action; the stertorous character of his breathing is likewise less marked. Laryngoscopic examination made on Saturday (the day before yesterday) showed but sluggish movement of the vocal cords on attempting to pronounce "ah," but good movement on forced inspiration. Any attempt to cough threw the cords into slight vibrations, and a fairly clear sound was produced—a marked improvement in the power over his larynx, for a few days ago no sound could be emitted. His muscular system, too, is recovering tone; he can now sit up in bed and move his arms and legs for any necessary purpose; indeed, so well and strong does he feel himself that he makes continual application for permission to get up, which was accorded him this afternoon. Bowels confined; ordered M. M. cum M. S. 3iss.

12th.—Got up for an hour or so last evening, and it was surprising to see how well he could support himself on his legs and shuffle across the ward. He feels none the worse for it this morning, only stiff and tired as after a long day's work.

27th.—Going out all but well.

Conjectural diagnosis.—Erysipelatous state of the cord?, or reflex inhibition of grey centres through the blood-vessels, or by other means.

CASE. Bulbar paralysis; fatal; no disease found.—A stout girl, looking well, came to the hospital on account of general weakness; she could scarcely walk or move about, she spoke slowly and had slight strabismus. The house-physician was inclined to regard the case as one of hysteria; as he possessed a special knowledge of eye affections, he saw nothing in the strabismus incompatible with this view. She remained in this state about a month, being neither better nor worse; she was able to walk about, but every movement of her limbs and speech was performed so slowly and deliberately that the case seemed rather one of lethargy from want of will than an actual paralysis. At the end of this period all the symptoms became

aggravated, and in about three days they had assumed all the well-marked characters of bulbar paralysis. She spoke most indistinctly, swallowed with great difficulty, and was quite unable to cough. The limbs were, however not paralysed, as she was able to get out of her bed. It was shortly afterwards seen that her respiration was becoming affected, the difficulty of which rapidly increased, and in a few hours she died. The medulla oblongata was very carefully examined, and no disease was found. It appeared quite healthy to the naked eye, and the microscope discovered no manifest change in the tissue.

CASE. *Bulbar paralysis with hemiplegia.*—A. M—, æt. 40, came to see me in November, 1867, with hemiplegia. About a year before, whilst with his regiment in Ireland, he had a severe apoplectic attack followed by paralysis of the left side, with some thickness of speech. He very slowly recovered so as to be able after some weeks to stand, and he was able to move his arm a little. He never recovered, however, beyond this point, so that when I saw him he was only able to walk with assistance and with the greatest difficulty; his arm was flexed across his chest and his fingers were rigid. His speech was slightly hesitating and slow. His intelligence and memory were good; he had never had an injury nor syphilis. About two weeks after I saw him he was taken worse and I visited him, his new symptoms having been coming on for two days. I found him with the appearance of a patient with bulbar paralysis; his mouth was open, his lower lip fallen, saliva running from the mouth in great quantity, and all expression gone from the face; the soft palate scarcely moved, and he swallowed with the greatest difficulty, keeping morsels of food a long time in the mouth; he could not cough, and his speech was scarcely intelligible. Thus he had the complete symptoms of bulbar paralysis added to his hemiplegia; and I apprehend that the softening process which had already been travelling down the motor tracts from the corpus striatum had now struck the more central part of the medulla.

SOME RELATIONS OF MENTAL DISEASE TO INHERITANCE.

BY GEORGE H. SAVAGE, M.D.

IN the following paper I have aimed at collecting together as many facts as possible, and from the collected facts drawing only such inferences as were just; besides this I have endeavoured to make plain my meaning by selecting typical cases. On looking over my work I see there are many points that may be disputed, and some readers may consider I have attributed too much to inheritance; to these I would say that the more carefully I study nervous disorders the more I am struck by the quantity of transmitted disease, and I had almost said the rarity of well-investigated cases without a neurotic history.

The question of the various relationships of neuroses to insanity and to each other will be considered, and I would suggest that much careful examination is yet required to know the physical relationships of these allied diseases. As in chemistry bodies unite to form fresh compounds unlike the components, so a combination of inherited nervous tendency with certain bodily weaknesses will produce different forms of mental disease.

I believe that the neuroses are nearly related to one another, but as yet we do not know how. They are probably related to each other through a similar character or structure of the nerve tissues by means of which they work.

We must never forget also that we do not only inherit certain structures called nerves, but also special liabilities and susceptibilities. Just as the "music of the moon lies hid in the plain eggs of the nightingale," so the far-reaching generalisations of a Newton lay in his inherited nervous system.

One nervous system is sent rocking to its fall by a shock that leaves unaffected another, and this has much to do with the inherited liability.

Dr. Maudsley has said "it is impossible to place any reliance upon the information afforded by statistics concerning the influence of hereditary predisposition in the causation of insanity, the difficulty of getting at the truth on this matter being such as to render them quite untrustworthy."

I believe this is in the main true, but feeling as deeply as he does the vast importance of the question, I have collected as large and complete a body of facts as I have been able, and hope to point out the special deductions from these facts.

That it is not only in insanity that the want of evidence of inheritance is felt, is shown by the differences of opinion among our leading physicians and surgeons. One looks upon the tendency to develope cancer as transmissible; another denies this: one teacher maintains that even a liability to take fevers may be passed on; another hardly allows phthisis pulmonalis to be inherited.

The more we study ourselves and our nearest blood relations the more we must be struck by correspondences. Not only does the gouty parent have gouty children or the bald father get children that are prematurely bald, but the tricks of the parent often reappear in the offspring. We all know cases in which a similar musical or artistic taste reappears, and not only is this true, but there are cases in which a special aptitude to work with special instruments is transmitted.

We may begin by remarking that physical peculiarities may be transmitted; thus several generations may have an extra thumb or finger, and in the same way I think I have seen similar shaped heads passed from parent to child in association with insanity.

Neither do all insane people have peculiar shaped heads, nor do all clever people have unusually large ones. But there are

cases in which the mental power is related to the size or shape of the head. There are differences in quality as well as quantity; this is seen in muscles and may be inferred in brains.

We often see large heads and heavy brains in people of no marked mental power. I have no doubt that there are more malformed heads among the inmates of an asylum than should occur in an equal number of sane persons. In one family I have noticed a peculiar shape in the heads of four members of it who have been insane, and I am prepared to find similar occurrences if they are only carefully looked for.

I have seen three sisters all of whom suffered from melancholia, and in all of whom the head was peculiar, being very small and narrow in front.

It has been said by French observers that the nervous and mental parts are rarely inherited from the same parent as the shape of the figure and head; that there is a kind of antagonism. This may be true, but I cannot from my own experience corroborate it.

The temperament and constitutional type are transmitted from parent to child. Intellectual powers, such as memory, powers of observation, knowledge of locality, imagination, &c., are also reproduced, and the same must be admitted of the passions, emotions, and will. The vices of a son may be but the echo of the vices of the father, the temperament descending and the same tendencies developing at particular ages and times. A hysterical mother may have hysterical daughters, who first show their neurotic inheritance at puberty, while the sons at the same age develop the insanity of pubescence.

Another parent who dies himself of some neurosis begets children who first show their inheritance in hypochondriasis or melancholy as they pass the climacteric.

“There is a destiny made for man by his ancestors.”

In the following pages I shall submit the statistics of Bethlem for the past five years, showing the number of admissions and the number of patients that have had insane blood-relations, placing separately those in whom the tendency was transmitted directly in the ascending or descending lines, and those in whom the family tendency was shown by the occurrence of mental disease in brothers, sisters, or cousins. I shall

also consider the additional tendency to neurosis exhibited by those who have parents suffering from some other tendency to degeneration such as phthisis.

I shall have to notice the proportion that is transmitted through the mother and through the father, as well as the nature of the transmitted disease; and I shall point out some tendencies, such as that to suicide, that reappear time after time, and examine whether there is any type of nervous disorders that is specially related to inheritance.

It will be seen that certain forms of mental disease have little or no tendency to transmission, and that in others the tendency is transmitted, but the form of the disease differs; in fact, we shall see that from the neurotic root many different branches may spring.

The question of curability of cases that have family taint must be considered, and the liability to relapse, and the point that in some cases similar causes produce similar results; thus a mother suffering from puerperal mania may bear a child whose first attack of insanity is caused by childbirth; and, again, an epileptic parent who becomes insane may beget a child who also becomes insane from epilepsy.

I admit that the statistics are far from perfect, but we have at Bethlem unusual opportunities for examining into the family histories, as most of our patients have intelligent near relations, who constantly visit them, and who can be got to give a fairly true history of the family. Probably our errors are greatest where the husband or wife alone is the informant, for the taint of insanity is often kept as the skeleton in the cupboard. In about 8 per cent. of our admissions the family history is unknown.

From the 1st of January, 1872, to November 1st, 1876, 443 male patients and 629 females were admitted, making a total of 1072. Of these we find that

143 males had one or more insane blood relations.

232 females ,, ,, ,,

375 total.

This is 34·9 per cent. of both sexes, the males having 32·2, and

the females 36·8. If we exclude those in whom this history was defective we find a total of nearly 38 per cent.

The next consideration is the quality of the relationship. We take as "direct," the insanity of parents or grandparents, and "collateral," that in which other members of the family, such as uncles and aunts, brothers and sisters, are insane. I think the fact that in certain families many members suffer though the parents are not themselves insane is of great interest, and requires more careful examination. Certain temperaments when combined seem to produce the most unstable results, and I have seen as great a number of insane children in a family where both parents were "nervous," but not mad, as in any family where both parents had been at one time or other insane.

Insane Relationships of Patients.

(It must be noted that some patients appear under several heads.)

	Male patients.		Female patients.	
Having insane fathers . . .	31	...	34	
„ mothers . . .	21	...	63	
„ grandparents . . .	17	...	30	
„ brothers . . .	25	...	41	
„ sisters . . .	28	...	55	
„ uncles . . .	22	...	31	
„ aunts . . .	26	...	41	
„ cousins . . .	14	...	20	
„ other blood relations	1	...	3	
„ several relations .	46	...	77	

We see that the insanity of the father passes pretty equally to sons and daughters, but the mother's insanity is specially dangerous to daughters.

It will be seen, too, that the number of female patients having insane sisters is very large, confirming the statement that the female sex has a specially great tendency to receive the taint from parents.

More patients have insane mothers than insane fathers; this was to be expected, as we know well that more women are insane than men, but the proportion of 65 insane fathers to 84 insane mothers is less than the proportion between the numbers insane of both sexes.

In the begetting of insane children each parent has about an equal share in passing on an insane taint, but the offspring being dependent on the mother while growing and being nourished in the womb, has a much greater chance of receiving physical and mental peculiarities from the mother.

It has been well shown by Galton how often genius is derived from the mother, and we shall have to notice cases in which precocious genius was derived from insane mothers.

In the world of physical science the fact that force can be transmuted is accepted; heat, electricity, and light may be products of the same cause, and may be lost in one another. In biology, too, the definite class barriers are breaking down, and in pathology we are waiting for some new and comprehensive mode of classifying that will allow of various, apparently different, results being produced by the same cause.

The dependence of the symptoms of insanity upon bodily states is allowed on all hands, and it is no longer in ridicule that one talks of a mad stomach or insane muscles.

As insanity and sanity depend so much on the bodily state, it is likely that morbid physical tendencies, that can be transmitted from parent to child, will have some effect on the nerve force or nerve state of the offspring.

I have been struck by several cases in which both phthisis and insanity were in the families, and have seen some cases live to become insane, while others maintained their reason, but sank from phthisis.

During the past three years I have collected the histories of the patients in respect to consumption, and I only accept, as a rule, the fact that the relations have died of wasting lung disease.

The following are the figures representing the connection of phthisis with insanity in blood relations:

Of 277 male patients and 401 female admitted into Bethlem Hospital during the three years, 1874, 1875, and 1876, 91 males and 155 females gave a history of insanity in their blood relations; and of these, 19 males, or 20·9 per cent., and 32 females, or 20·6 per cent., had in addition lost blood relations from phthisis in some or other form.

As we proceed to examine particular cases we shall see the relationships of phthisis more clearly marked.

The division of insanity into mania, melancholia, and dementia, or into the endless number of groups and classes preferred by some writers, is quite immaterial. I have got into the way of looking at all cases as "general paralysis," and "not general paralysis;" these are the only two natural divisions, and they will be found to contain many subclasses and orders. It is necessary for convenience to use the terms mania and melancholia, and I have sought to trace the relationships of these states to the states of mental disease in the relations.

I have not been able to collect many trustworthy results, but looking through the admissions, I have noted thirty-one instances in which the patients and some near blood relations had suffered from similar attacks; that is, that the symptoms had been of the same nature, whether maniacal or melancholy, in both. But of these thirty-one instances I find twenty-one were melancholy and ten maniacal. We shall see later that this fact is brought out more strongly when we consider the special tendency of suicide to descend. I cannot explain why states of depression should be transmitted rather than those of excitement, but in passing may hint at some possible influences. Melancholy lasts longer, and more slowly seems to modify the whole bodily condition, the ideas more often revolve in a smaller circle, the whole mental life being swallowed up in one mental pain; on the other hand, in mania we get a constantly changing mental state.

These are not quite satisfactory explanations, or we should more frequently get direct inheritance of the same false ideas and the same tendency to hallucinations of special senses. Something is due to the physical state of the body inherited. I have been struck by the wonderful likeness in sisters who have been in Bethlem suffering from similar attacks of melancholia. The frequency of melancholy among the dark thick-haired people should be taken into consideration in tracing this tendency.

We shall have to notice that similar causes, such as childbirth, may produce similar attacks, or may produce different forms of mental disease; but this is not surprising when we know that similar causes, whether mental or physical, will produce different forms of mental disease in the recurring attacks of the same patient.

I subjoin a table showing the nature of the symptoms of the patients with neurotic inheritance admitted during five years :

	Mania.		Melancholia.		Dementia.		Delusional insanity.		General paralysis.
Females .	97	...	101	...	10	...	24	...	—
Males .	52	...	69	...	6	...	5	...	11

Of 207 cases of puerperal insanity examined by me (see ‘Guy’s Hospital Reports,’ vol. xx, 1875), 65 had family taint, of which 22 were from the male side, 37 from the female side, and 6 were unknown.

Under dementia I put cases that had distinct loss of mental power from the first, not due to any painful impression; and under “delusional insanity,” I class those cases who from the outset of their malady seemed to have formed a new mental basis for themselves, in which what we call delusions took the place of sane perceptions. Thus one is always being subjected to mesmerism, another to galvanism. In one the nightly sleep is disturbed by violators, and in others voices torment and annoy. These cases are more common among women than among men, and are eminently unsatisfactory.

Relationship of Epileptic Inheritance to Insanity.

The epileptic parent may have epileptic offspring, just as the famous guinea-pigs who suffered from artificially produced epilepsy passed it on to the next generation and these again to their young.

We have no opportunities for investigating this direct transmission at Bethlem, as epileptic patients are ineligible, but we find a certain number with the transformation of neurosis. Trousseau, and more recently Dr. Bristowe, have written on this transformation, and both writers consider besides this that epilepsy itself is often inherited.

I subjoin a list of the cases admitted since 1872 that have an undoubted history of epilepsy in relations; it also shows the numbers of males and of females, the form of insanity, and the degree of relationship of the epileptic relations.

1. Male.—Brother epileptic; sister insane; maniacal; recovered.
2. „ —Father epileptic; none insane; melancholy; uncured.
3. „ —Brother epileptic; father insane; maniacal; recovered.
4. „ —Paternal uncle epileptic; cousin insane after a fever; recovered.
5. „ —Two brothers epileptic; none insane; maniacal; recovered.
6. „ —Paternal aunt epileptic; paternal aunt insane; maniacal; recovered.
7. „ —Maternal aunt epileptic; none insane; melancholy; recovered.
8. „ —Brother epileptic; brother idiot; maniacal; recovered.
9. Female.—Sister epileptic; none insane; maniacal; recovered.
10. „ —Sister epileptic; none insane; maniacal; recovered.
11. „ —Sister and brother epileptic; brother insane; maniacal; recovered.
12. „ —Mother epileptic; none insane; maniacal; recovered.
13. „ —Brother epileptic; grandmother and mother insane; maniacal; uncured for special reasons.
14. „ —Paternal uncle and brother epileptic; paternal aunt insane; father excitable; cured.
15. „ —Two aunts and one sister epileptic; sister died of brain disease; maniacal; cured.
16. „ —Great grandfather epileptic; none insane; dementia; uncured for special reasons.
17. „ —Great uncle and great uncle's daughter epileptic; father a suicide; acute mania; cured.

This table is full of interest, though smaller than could have been desired for any certain results. It bears out the facts now usually acknowledged in respect to epilepsy and insanity. It will be seen that the table adds proof to the belief in an intimate union between the branches of the neurotic tree. We have seventeen cases suffering from insanity who have epileptic blood relations, and, besides, ten of these have other relatives who are or have been insane. In only two cases were the parents epileptic, and in one the father passed on the taint to the son, and in the second the mother passed it on to the daughter. In a great number of cases a brother or sister suffered from epilepsy.

Among the other relatives of the patients who were insane we have every variety of neurosis; thus, one maniacal patient had a brother an epileptic idiot, another a suicide for a father. In one female case the grandmother was insane, the mother odd, and the brother an epileptic. We are far at present from being able to say how the types are varied, but we must admit that there is a deep causal relationship in all these cases. It is noteworthy, too, that an insane father may have one son insane and one epileptic.

With epilepsy, as is well known, we have peculiarly impulsive maniacal attacks that may precede, accompany, or follow the epileptic fit, or, as pointed out by Trousseau and other French authors, these attacks of oddness or mania may take the place of the fit altogether in the so-called *épilepsie larvée*; and in the foregoing table it will be seen that most of our cases suffered from maniacal attacks, there being only two suffering from melancholia, neither of whom had other insane relations. One case was admitted suffering from acute dementia, which was in some way connected with her recent marriage and the violence of her husband. I would not lay too much stress on this because, as I said before, my list of cases is small, but this maniacal state and the great proportion of recoveries are striking peculiarities that make one look for some deep and interesting physical connection between the diseases. In epilepsy we have a very unstable condition of the nervous system that seems to collect force and allow slight, though often definite and fixed, irritation to discharge it, and so mentally we have rapid discharges of nerve force in another direction that soon lead to the re-establishment of the mental balance. To prove this we need a large mass of facts not only confirming what has been said above, but also showing whether there is a greater liability to relapse in those related to epilepsy than in others.

There was nothing at all peculiar in the causes given as the excitants of the attacks in these patients with epileptic relations. Fright in one produced temporary dementia, and scarlet fever in another produced acute mania.

Besides epilepsy we have to notice that a good number of our patients have had parents who died of apoplexy or paralysis. In predisposed persons atheroma of the vessels of the brain may lead to insanity; we do not know yet the minute changes required to produce insanity, but as in some cases of heart disease we get melancholia, so in some cases of atheroma we get depression, with ideas of obstruction of the bowels; but with thickened vessels we may have an unstable condition of mental function—mania, in fact. I am fully convinced that just as from their inheritance some are bound to die through disease of their lungs, so others are bound to die through their nervous tissues, and I have seen several well-marked cases in which young

patients have been insane whose near relations have died of senile mental changes or apoplexy.

The following is an instructive example of the above connection:—Charles M—, single, æt. 25, draper's assistant. Maternal grandmother became insane at seventy-five, and is now a dement aged eighty-one years. A great uncle had fits. The patient's father died of phthisis. The patient had always been sober and industrious. Three months ago, after a holiday spent in the country, during which he exposed himself a good deal in the hayfields, he suddenly became excited, sleepless, and talkative. He fancied he had not treated his mother well, and was restless and uneasy; he rapidly became more quiet but weaker in mind, and has already all the appearances of being a chronic dement. It was supposed that sunstroke was the cause of his trouble, and admitting the hereditary predisposition we may accept the effect of the sun as the exciting cause. I have seen one or two other cases with strong inherited taint upset by exposure to the sun, though in none have I been able to get any history of insensibility or severe general disturbance at the outset.

Another epileptic case is the following:

Insanity on the father's side; inheritance of phthisis and epilepsy.—Louisa B—, single, æt. 30. Domestic duties, one previous attack of insanity. Has had typhoid fever and smallpox, and has been in failing health since 1866. Has suffered from neuralgia. Had fits said to be epileptic six years since. The exciting cause of the present attack was the removal of some teeth; she had to submit to two operations on succeeding days, the first day without, the second with, "gas." After this she became gradually more dull and lost, and had been under treatment for eight months without any benefit, when she had a slight epileptic fit, and since then she has steadily improved.

The above case has many points of interest. The father was insane for fifteen months some years before the birth of our patient and recovered, and he remained well till near his death, when he again became insane.

A sister of the father was subject to recurrent mania, and

died at thirty-nine years of age. On the father's side there was phthisis. Thus we have a stock that is highly neurotic, that is, that breaks down in its nervous relations.

Our patient had had more than her share of depressing influences, and when she reached maturity had epileptic fits. To add to this patient's risks I should say that she is a child of old age. When she became ill from any cause she suffered in her nervous system; thus, she had neuralgia, epilepsy, and insanity. Why the epileptic fit should cause a temporary amendment I cannot say, but may add that this is the third case of young women similarly affected and similarly relieved that I have notes of.

Next we shall consider the effects of drink in the parent in producing a tendency to mental disease in the offspring; it has long been believed that idiocy is often due to drunkenness in the parents. The love of drink in the parents has a great tendency to reappear in the children. Drunkenness in the parent may be followed by epilepsy in the children. I have seen a good many cases in which a tendency to drink in one generation reappeared as true insanity in the next.

On the other hand, I have seen cases that convinced me that drink-craving has been the result of nervous disease in one or other parent. Some epileptics have temporary and irresistible cravings for drink, and in some pregnant women the same occurs, the physical weakness and the longings of pregnancy demanding stimulant. Women at the climacteric too not unfrequently develope this craving.

What I would most insist on is that the craving may be the result of neurotic inheritance, and may be associated with one or other of the true nervous diseases.

I append a few of the most interesting cases that have lately come before me.

Sex.	Relation who was drunken.	Form of mental disease.	Result.
1. Male ...	Grandfather	... Melancholia	... Died.
2. „ ...	Father	... Mania	... Uncured.
3. „ ...	Grandfather	... General paralysis	... Died.
4. „ ...	Father	... Mania	... Cured.
5. Female ...	„	... Melancholia	... „
6. „ ...	Grandfather	... „	... „
7. „ ...	„ and father	... „	... „
8. „ ...	Aunt	... Delusional	... „

Sex.	Relation who was drunken.	Form of mental disease.	Result.
9. Female ...	Aunt	... Delusional	... Uncured.
10. „ ...	Mother	... Melancholia	... Cured.
11. „ ...	Brother	... Dementia	... Uncured.

It is always difficult to get true histories in relationship to drink, for the inveterate drinkers who probably produce the worst effects on their children are the quiet and secret ones.

Case of transmitted tendency to drink with insanity.—Mildred S—, single, æt. 25. Her paternal grandfather was in Bethlem suffering from insanity produced by drink; after fifteen months he recovered, and lived fourteen years, dying of paralysis. His son was healthy, but our patient without any known cause became depressed, complained of “perverted feelings” and was suicidal; she took to drink “to drown her thoughts.”

On admission she was restless and wretched, sleepless and without appetite; under treatment she gradually improved, was discharged cured at the end of ten months, and has remained well during the past three years.

Case of drink in father and grandfather.—Alice B—, single, æt. 24, dressmaker. The grandfather was insane, it is said, from drink; the daughter of this grandfather was insane. Phthisis was present on the father’s side, he himself dying of it. He was a drunkard before the birth of our patient, who has always been highly nervous. For the last seven years the patient has been subject to convulsive movements of the right half of the body, so that she could not hold things in her right hand. Six weeks before admission, menstruation being absent, she became hypochondriacal, fancying her liver was out of order; she then became religiously depressed, and began to imagine that medicine she had taken for her liver had completely ruined her.

On admission she fancied her back bone had passed with her stools, and that her flesh was withered up. She was in a state of active melancholy. The convulsive movements of the right side continued, the right sterno-mastoid was rigid; galvanism, tonics, and general remedies very slowly improved her condition, so that after twelve months she was discharged well and has kept so for two years.

The next case is one in which there was *inherited insanity* exhibiting itself in drink-craving.

Annie B—, married, æt. 60; mother and one brother insane. She was temperate and industrious till four years ago; she then took to spirit-drinking and at the same time her whole nature seemed changed. She became violent, untidy, suspicious, and jealous. Threatened suicide, and wandered from home. Fancied persons were trying to poison her. On admission she was a stout flabby indolent person who was sly, as drinkers generally are, in securing extra drops of beer, &c.

She was once before under treatment and was discharged well, but only refrained from drink a very short time, and redeveloped her habits and delusions. There is no prospect of any permanent cure in such a case, at such an age.

Case of insanity from drink, insane parentage.—Henry B—, married, æt. 33; father and sister insane; clerk in a government office. Had been industrious and steady till recently, when he took to promiscuous drinking. He was led to this from a constant sinking feeling, which drink relieved for a time. He became suicidal, and developed all the slyness of insane drinkers; no treatment out of an asylum could keep him from his enemy. The chief symptoms of insanity in his case were the drink-craving regardless of appearances or consequences, and an incontrollable desire to destroy himself. A year's treatment greatly relieved him, and he started for a new trial in the New World.

That drink-craving occurs as a disease I fully believe, and that this disease is a branch of the neurotic tree I as fully believe. Such a case as the above is but one of many in which we see the metamorphosis of symptoms. There is an interesting connection between drink-craving and epigastric malaise. Often both in mania and melancholia we have complaints of uneasiness, weight or pain at the epigastrium, and in most of the drinking cases we see the same thing exaggerated.

Father cruel and a drinker; insanity on mother's side; phthisis.—George M—, single, æt. 20, shopman. Father was a violent man who gave himself up to drink; he was separated from his wife on the ground of cruelty. Mother's brother

insane. Mother died of grief, or probably, according to the history, from phthisis. The patient was a clever boy, but self-conscious and much given to introspection. The first attack brought him into Bethlem; he was suffering from acute mania chiefly characterised by hallucinations. He fancied the birds and beasts spoke through him. He had no control over his thoughts, and often used obscene language. No treatment did him good, he became a quiet, self-absorbed patient, and was discharged uncured, after two years' treatment.

Mother a drunkard; no other neurosis in family.—Mary E—, single, æt. 26. Mother for some years has been a confirmed drunkard, using every artifice to secure drink. She is violent and dangerous when under the influence of drink. The cause of the attack in our patient was a love disappointment; associated with this was amenorrhœa.

She was suffering from hypochondriacal symptoms; she imagined some evil was at hand, and used to bite her nails; there had been no tendency to drink in her case.

I have the short notes of one case in which a grandfather was insane, his son and daughter both inebriates, and insane inebriates too, while of his grandchildren one girl was an imbecile and another became a chronic maniac after oversuckling. Such is the fatal chain of insanity and drink.

As has been already mentioned, the tendency to suicide is very often transmitted, and is most strikingly exhibited in a series of cases that I shall refer to. This question will have to be considered generally. Suicide may arise from so many different mental states that in saying that persons inherit a tendency to suicide I do not imply that they inherit the same delusions that produced suicide in their parents; just as we saw that epileptics and maniacs inherit a peculiarly unstable nervous state, so these patients seem to inherit a peculiar impulsive tendency to shirk troubles and vexations by self-destruction. No doubt the tendency to imitation must be considered, and this is a most important point in insanity generally. Not only has inheritance great weight, but education and the surroundings have great influence in weakening or establishing the mental balance.

We shall consider later an interesting series of cases in which both husband and wife became insane, and in respect to the contagion of mental disease we must refer to that portion of the paper.

The next table shows the patients who have had near relations who have committed suicide. The first half consists of those who also themselves had strongly marked suicidal tendencies.

Sex.			Relation who committed suicide.
1. Female	...		Sister.
2. "	...		Son.
3. "	...		Brother.
4. Male	...		Sister and many others. See below.
5. "	...		Grandfather.
6. "	...		Father, brother, &c. See below.
7. "	...		Brother.
8. "	...		Father.
9. "	...		Maternal aunt.
1. Female	...		Father.
2. "	...		Son.
3. "	...		Sister.
4. "	...		Grandfather.
5. Male	...		Father.
6. "	...		"

I shall add short histories of some of the most interesting cases, first giving some in which many of the family were affected; cases in which long distances and long periods separated the members of the family and yet they one by one killed themselves.

We have others in which the shock of a son's or sister's suicide produced insanity, often having the same gloomy aspect. We do not yet fully understand the fascinations of a dominant idea. All sorts of explanations have been given about the feeling of desire to precipitate oneself from a height or under a train. I cannot add another explanation, but I can point out a somewhat similar mental state.

A patient is shocked by the suicide of some dear friend and may thus be rendered more unstable. The idea of suicide, like the idea of precipitation, is definitely brought home to the person and the constant dwelling on any idea in some minds is the first stage of performance.

I have known a homicidal idea fixed in the same way so that a husband who was dreading that he would have to kill his wife to save her from a savage outrage passed into the condition of homicidal mania.

We shall see that suicidal tendencies may be directly inherited; they may spring from parents with other mental disease, or may appear side by side with other neuroses, one of a family being suicidal, and another epileptic. Again, other mental diseases in parents may appear as suicidal tendency in the children.

Suicidal tendency in a youth of insane and suicidal family (Case 5 above).—A. P—, æt. 17, maternal grandfather and aunt and uncle insane. Father demented and aphasic, sister committed suicide; no known cause for this attack. A month before admission he left his work and appeared strange, became very irritable, and then secured a pistol and fired it at his head; he produced a severe wound. He became better after this attempt, and said he could not account for his conduct; that the time was a blank to him until the infliction of the wound. In the hospital he behaved fairly well for a time, but soon exhibited great want of self-control, and would fly into a passion on little or no provocation: at times he complained of his head. Three months after admission he attempted to cut his throat; he cut the skin with some small piece of glass or metal; this was done in a sudden passion, but he had evidently provided means to injure himself beforehand. He never became trustworthy, and was discharged uncured.

Case of suicidal tendency in three generations (Case 6).—H. B—, æt. 45, married; merchant. First attack, of two months' duration, due to money losses. Grandmother drowned herself. Father insane at 45 (the age of patient). Recovered, but hanged himself at 65. Cousin killed himself in Australia. Brother hanged himself. The patient refused food, was threatening both to others and to himself; talked to himself, and wandered about vaguely. He had before refused food, so that he was very weak on admission, and gradually sank and died within three weeks.

Suicidal tendency in mother following suicide of insane son

(Case 2).—Ann H—, æt. 55; married. Fourth attack of insanity. Son committed suicide in Hull Asylum. This patient was of a highly nervous temperament, and had been in the habit of taking opium. Her previous attacks of insanity have been similar. She is described as having a craving to end her life. A twelve months' treatment has made her well enough to be tried at home.

In another case of interest the inherited tendency is shown, as well as the contagion, if I may use the term.

Ann W—, æt. 47, widow, has had four previous attacks of a similar character. No history of family taint before her time. Her husband committed suicide without any grave cause. The patient's son drowned himself because he was refused by a girl; his death seemed to have very slight effect on the mother at the time, but she gradually became odd, and within a fortnight she was admitted in a maniacal state. Her first attack was supposed to be due to over-lactation. The last one continued eight months, and she has kept well since, now two years.

In the next case two sisters had similar suicidal tendencies, the attack in our patient being brought on by the suicide of her sister.

Eliza J—, æt. 44, married. Has had nine children and no previous mental affection. Has had rheumatic fever. No history of insanity in any elder branches of her family. She was much shocked at the death of her sister, who committed suicide while on leave from another asylum. Here again the fixed idea became falsely interpreted and acted upon. She fancied her sister's death was due to her, and sought every means to accomplish her end. No change was effected in her condition for some months. She then became more excited, had an epileptic fit, and became more noisy after it. The epileptic fits being repeated, she was discharged uncured.

It must not be supposed that all suicidal cases inherit the impulse or tendency directly, that it passes from father to son like an estate. We shall have to notice next the second part of our table of suicidal relations, and shall there see that out of six cases, four suffered with maniacal and two with melancholic symptoms.

Several of the cases will bear reporting from both their special and general interest.

F. S—, æt. 22, single; student. This patient has a good deal of talent for art, is related by blood to some of our most distinguished artists. The father of the patient was of peculiar temper and temperament; he has committed suicide since his son's attack. On admission he was suffering from very acute mania; had great exaltation of ideas. The case was rather a long one, but ultimately got well. The interesting relationship of genius to insanity will have to be considered later. I find very few men of genius in an asylum, whether genius is regarded as a power for steady objective work, or as an inborn power of appreciation of likeness and relationship; but we do meet with the children of insane people who have developed prematurely. I look upon a child who plays classical music almost instinctively, or the calculating child, as I look upon the child that menstruates as an infant and has sexual desires in its cradle.

Suicide in paternal grandfather; father peculiar; the patient herself slightly suicidal when admitted, but only for a time.—Amelia H—, æt. 37, single; servant. This was the first attack; no known cause. It began four months ago with hypochondriacal symptoms; she fancied she had all sorts of diseases, and would never get well. The chief peculiarity in her case was, that she said that everything appeared black to her when she looked out of doors during the day; at night this did not occur; she heard voices at times also. She never made any attempt on her life, and gradually lost her hallucinations and recovered, leaving the hospital after eighteen months' treatment.

I add a single example of the descent of a neurosis in which the son of an eccentric became intensely suicidal.

William P—, single, æt. 21, student at Oxford (1st class mods.). Father so eccentric as to be considered insane by his friends, though allowed to be at large. The patient masturbated as a boy, but said he had given up the habit entirely. He was a most industrious and successful student, passed his examinations, and had no trouble to worry him except his mental state. He compared his condition to the feelings of "palpitation of the

heart transferred to the brain," so great were the anxiety and deep feeling of consciousness. He called it excess of self-consciousness. Just before admission he attempted to shoot himself; he also threw himself from a high window, but sustained no injury. He rapidly improved in Bethlem, so that within two months he was sent to our convalescent home in Surrey, and after about three weeks there was discharged on leave of absence. During the whole of this time he had never shown any return of his suicidal tendency, and yet within a week of his leaving Bethlem he shot himself and died in St. George's Hospital of the self-inflicted wounds.

I should have liked to have been able to have added something of importance on the question of consanguineous marriages as far as the contracting parties, one or both, were insane, but I have only two cases to report.

My experience in the lower animals would lead me to think breeding in-and-in especially of highly bred animals is dangerous and usually disastrous.

Marriage of cousins; insanity in the family.—Jane A. W—, single, æt. 49. Second attack. Paternal grandfather and brother insane. Her parents were cousins. The first attack was twenty-four years ago, produced by love disappointment. She has never been strong in mind since. Present attack came on without any known exciting cause. She was sleepless and depressed, wanting to wander from home.

She soon passed into a state of worry, daily asking to go home, never occupying herself except by watching the doors. There is now no prospect of cure, as eighteen months have elapsed.

CASE 2. Parents first cousins; no neuroses.—H. B—, single, æt. 22. One previous attack. Domestic anxiety given as the cause of this attack. Parents first cousins. No insanity in family. The father was a very irritable man, and had struck this patient a severe blow on the head. The mother was rather more dull than most people. Our patient was noisy, maniacal, and amorous. She rapidly became quiet, and was discharged cured. She is one of the cases of unstable equilibrium that we shall see again.

I may add here an interesting series of cases that would give matter enough for long and intricate investigation. We are told that marriages are more often the result of sympathies than contrasts. At least such is the case with the parents of men of science; if such be the case we shall not be surprised to find that a certain number of patients with insane tendencies marry other neurotic people. This is one way of looking at the question, and I have seen such sympathies and their results; but I believe that some cases of insanity in both husband and wife have been due to the shock on one of the insanity of the other. That this is true I believe is shown by one of our cases (No. 1) in which the husband became insane, but recovered. The shock of his insanity was so great that the wife became insane, and like many cases of severe shock or injury she never recovered. It will be doubtless objected, that I am constantly saying it is not every one who can go mad, and yet here is one with no predisposition who does. I believe mental symptoms rarely occur in those not predisposed by inheritance, but that where they do they are of very serious import. As Dr. Sutton has said, the language of the lungs in disease is a cough, and the language of diseased brain is diseased thoughts, so that a brain damaged by shock may exhibit morbid ideas.

Husband and wife insane.—George D—, æt. 59. First attack. One sister insane, but recovered and died sane. Patient's eldest daughter was in Bethlem. The cause of this attack was said to be trouble and rheumatic fever. The daughter was insane before her father. The patient gradually but slowly improved. He was suffering from melancholia, and fancied his bowels were obstructed. He was discharged well after fifteen months' residence in the hospital.

Mary A. D—, æt. 52. First attack. No insane relations beyond her step-daughter above mentioned. The assigned cause of the illness was shock at the husband's madness. She became very much depressed, and fancied she was the cause of all the family trouble. Here again we see the effect of dwelling on a sad idea till the patient imagines he is the cause of it.

Mrs. D— never made the slightest improvement; for some time she was fed with the stomach-pump. After twelve months' treatment she was discharged uncured.

Our next case was referred to among the suicidal cases. Her husband and son both committed suicide, and she has had five attacks of insanity. Thus in two cases we have the danger of inheritance and the danger of imitation or sympathy well shown.

In the next both husband and wife were of highly nervous temperament, the husband while in Bethlem having several well-marked hysterical attacks. It is noteworthy too that in neither case was there any acknowledged taint in the families.

Edwin M—, æt. 31, first attack, no cause given, though he has been drinking for twelve months to excess. He has had genuine hysterical fits for six years. He said he should drown himself. During his stay in Bethlem he was nervous, had little or no self-control and was very emotional. He recovered in four months.

Sarah E. M—, æt. 26, first attack. All her family excitable, none insane. A month after marriage, having become pregnant, her whole character and demeanour altered. She was kept at home till three months after delivery, when she was brought here. The child was born healthy and lived. Mrs. M— recovered after only two months in the hospital. Next year we heard she was again pregnant and again insane. She was sent to a private asylum for treatment and delivery, as we do not admit such cases, and she died, according to the husband's account, of phthisis shortly after delivery.

Of the next cases I have less perfect histories.

Phœbe L—, married, æt. 58, first attack; no other insane relations. She is suffering from chronic mania, is violent, destructive, and obscene. Her husband is said to have been insane also.

Eliza R—, widow, æt. 55, no insane blood relations. Husband died in an asylum twenty years ago. The solitude of widowhood was supposed to be the predisposing cause, but she

had given way to drink latterly. She became sleepless, suspicious, and excited, and had many delusions. She slowly recovered and was discharged cured at the end of eleven months.

The last case we have is that of Louisa L—, æt. 50, married. No family taint. Has suffered herself from neuralgia. Her husband is suffering from general paralysis and is a dement: she has exhausted herself in attending on him. We have here another example of how a morbid idea grows. She was constantly dreading his death, yet at last she had to be sent here, as she threatened to murder him, lest they should remove him from her. She had a slight fit that left her weak in the left arm and leg; she was greatly excited for a time but rapidly became quiet, and is now convalescing; she still has some hemiplegia.

This concludes the cases. I think in this place no more need be said, as they speak for themselves as to the points already suggested. In the last it must be considered as a peculiar coincidence that both are more or less paralysed.

It is not only my object to point out what I have observed myself, but to suggest lines of observation to be followed by myself in future or by others. The condition of the parents at the time of procreation is of vast importance. We have noticed that it has been said that idiots may be the offspring of parents drunken at the time of begetting; we have noticed some cases that had parents who were insane before the birth of the patient, and I have noticed several cases where the last children, the children of old age, have had marked feebleness. I have seen one man who was fairly healthy himself but of strumous stock; he begat fairly healthy children, and then after the lapse of years his wife had another child, bearing strongly the family features, so feeble and cachectic that her life was one burden from childhood to eighteen, when she died. She had a large hydrocephalic head, strumous glands, weak nervous system, vague pains and wants, and finally died of phthisis. This is paralleled by some cases I have seen in insane patients. I have notes of several, and will add one.

Robert M—, single, æt. 14; no neurosis in family. Born many years after his last brother when both his parents were

over fifty years old. His brothers and sisters are strong ; he is the weak one of the family. He was always weak and dull. His parents despaired of making anything of him till he was ten years of age, when he suddenly brightened and learned fairly and worked well ; he left school at thirteen and went into a printer's office. He learnt to masturbate there and this was the cause of his breakdown. The struggle of virtue or self-respect against this habit upset his slight balance, and he became persecuted with the idea that he was possessed by an evil spirit, and must use bad language. He threatened suicide, and threw a knife at a friend. He was weak and anæmic, melancholy, and unstable. Nine months in the hospital restored him to his old condition, but I do not think he can stand the strain of the outer world.

In another case I have seen the youngest child of a father who had been insane, the only one insane. In this family there was also phthisis. The mother was healthy.

We now pass on to consider cases that have several members of the family insane—cases that may be said to have been saturated with insanity.

Insanity of several Members of the Family.

MALE PATIENTS.

1. Mania	... Two aunts	... Uncured.
2. Melancholia	... Two brothers	... Cured.
3. "	... Maternal uncle and two aunts	... Uncured.
4. "	... Father and brother	{ Unc. for special reasons.
5. Acute dementia	... Three sisters	... Cured.
6. Mania	... Aunt and cousin	... Uncured.
7. "	... Paternal aunt and sister	... Cured.
8. Melancholia	... Father and sister	... "
9. Mania	... " "	... "
10. Melancholia	... Sister and cousin	... "
11. "	... Father, brother, child	{ Unc. for special reasons.
12. "	{ Grandfather, father, sister, and brother	} Uncured.
13. Mania	... Aunt and sister	... Cured.
14. "	... Maternal aunt and mother	... "
15. Dementia	... Aunt and sister	... Died.

16. Melancholia	... Mother and two aunts	... Uncured.
17. Dementia	... Mother and brother	... —
18. Melancholia	... Sister and daughter	... Cured.
19. General paralysis...	Father and cousin	... Uncured.
20. Melancholia	... Mother and brother	... "
21. Mania	... Paternal aunt and sister	... Cured.
22. Melancholia	{ Maternal grandfather, uncle, and mother }	Died.
23. Delusional	... Paternal uncle and sister	... Uncured.
24. Melancholia	{ Maternal great grandmother and grandmother }	"
25. Mania	{ Two brothers and a sister; mother nervous }	Cured.
26. Melancholia	... Paternal uncle and cousin	... "
27. "	... Paternal aunt's father	... "
28. Mania	... Cousin and great uncle	... "
29. Melancholia	... Paternal uncle and aunt	... —
30. Mania	... Maternal grandfather and uncle	... Cured.
31. Melancholia	... Paternal aunt, maternal grandfather	... —
32. "	... Sister and cousin	... —

FEMALE PATIENTS.

1. Mania	... Grandfather, uncle, and brother	... Cured.
2. Melancholia	... Mother, father, and brother	... Uncured.
3. Mania	... Great aunt and aunt	... Cured.
4. Melancholia	... Aunt, cousin, and brother	... "
5. Mania	... Two sisters	... Died.
6. Melancholia	... "	... Cured.
7. "	... Uncle and cousins	... "
8. "	... Brother and sister	... Uncured.
9. Mania	... Father and brother	... " sp. reasons.
10. "	... Mother and sister	... Died.
11. Melancholia	... Two uncles and brother	... Cured.
12. "	... Mother and sister	... Uncured.
13. "	... Mother, maternal aunt, and brother	... Cured.
14. "	... Two sisters	... Uncured.
15. "	... Paternal grandfather, father, aunt	... Cured.
16. Mania	... Mother and sister	... "
17. "	... Paternal uncle, and aunt's mother	... "
18. "	... Two paternal uncles	... "
19. Melancholia	... Maternal uncle and aunt	... "
20. "	{ Maternal grandfather, maternal uncle, mother? }	"
21. "	... Maternal grandfather and uncle	... Uncured.
22. Mania	... Grandmother and aunt	... Cured.
23. Melancholia	... Mother, uncle, and sister	... "
24. Mania	... Uncle and sister	... "

25. Delusional	... Mother and brother	... —
26. Mania	... " "	... —
27. Melancholia	... Sister and niece	... Cured.
28. Mania	... Father, mother, and sister	... —
29. "	... Mother, paternal uncle, and aunts	... Cured.
30. "	... Paternal aunts	... Uncured.
31. Delusional	... Maternal aunt and sister	... Cured.
32. Mania	... Paternal grandmother and aunt	... Uncured.
33. Delusional	... Father and sister	... Cured.
34. Mania	... Mother and brother	... "
35. Melancholia	... Aunt and brother	... "
36. Mania	... Paternal aunt, paternal great aunt	... "
37. "	{ Paternal great aunt, paternal uncle, and brother; father odd }	{ " }
38. "	... Mother, sister, and brother	... Cured.
39. Melancholia	... Mother and paternal uncle	... Uncured.
40. "	... Paternal grandfather and brother	... "
41. "	... Grandfather, mother, and brother	... Cured.
42. Mania	... Maternal uncle and aunt	... —
43. "	{ Maternal great uncle, mother, and father }	{ — }
44. Melancholia	... Maternal aunt and two brothers	... Cured.
45. "	... Grandmother and aunt	... —
46. "	... Father and paternal aunt	... Cured.
47. Mania	... Maternal uncle, cousins, and mother	... Uncured.
48. "	... Grandfather and two cousins	... Cured.
49. "	... Father and paternal uncle	... "
50. "	{ Two uncles and a cousin; mother apoplectic }	{ — }
51. "	... Mother, father, sister, and aunts	... Cured.
52. "	... Mother and aunt	... "

The above tables show the number of patients that have had more than one relation distinctly insane; I have left out many cases in which there were other neuroses, as including all of them would have forced me to make the tables unwieldy. I have noted the form of insanity the patients suffered from and the result as far as recovery. The cases followed by a dash are still under treatment. It will be seen that a multiple inheritance does not necessitate a larger dose of insanity, or, at least, a less chance of cure; in fact, among the females, we get a larger percentage of cures among those with strong taint than among those with slight.

We must ever bear in mind that as the general female intellect is more guided or governed by emotion than the male,

so is it more easily upset or shifted from its balance. It requires a severe blow to unbalance a strong man's mind, and if once the balance is lost one may be sure that in most cases nothing will readjust it. I am inclined to believe that the inheritance of insanity is the inheritance of an unstable, emotional, or brilliant intellect, and that hence we have a nervous system that is readily upset but readily readjusted.

Certainly the cases in which I have seen the greatest number of relapses and the greatest number of cures have had a strong taint, either from the numbers of relatives affected or the direct or absolute nature of the inheritance; thus, in several such relapsing cases the mother was insane during her pregnancy with the patient.

In some other cases the force of the taint is measured by the number of the family affected; thus, I look upon the inheritance as presumably very strong if three or four of one family become insane.

In most of such cases I believe recovery may be anticipated several times.

It often becomes a question from the frequent recurrences whether the patient is not better altogether under care. I think that these strongly tainted persons usually get the attacks at shorter intervals as they go on.

It is noteworthy, also, that whereas one short, sharp attack of acute mania may leave one person a dement, another strongly tainted patient may have dozens of such attacks, and yet have during the intervals perfect sanity and acute powers of reasoning and perception.

Frequent recurrences with strong taint.

1.	Female	...	Mania	...	4th recovery	...	Mother insane at her birth.
2.	"	...	"	...	4th	"	" puerperal insanity.
3.	"	...	"	...	5th	"	" violently maniacal.
4.	"	...	Melancholia	...	4th	"	... Father melancholy.
5.	"	...	Mania	...	3rd	"	... " (recovered also).
6.	Male	...	"	...	3rd	"	...
7.	"	...	"	...	3rd	"	... Mother and brother.
8.	"	...	"	...	3rd	"	... Father and sister.
9.	Female	...	"	...	4th	"	... Two uncles, cousin, mother.
10.	"	...	"	...	3rd	"	... Two aunts and sister.
11.	"	...	"	...	6th	"	... Two sisters.

- | | | | | | |
|----------------|-------|-------------|--------------|-----|--|
| 12. Female ... | Mania | ... | 4th recovery | ... | Paternal great aunt and paternal aunt. |
| 13. „ | ... | Melancholia | ...13th | „ | ... Mother, uncles, and sister. |
| 14. „ | ... | Mania | ... 4th | „ | ... Two sisters. |
| 15. Male | ... | „ | ... 3rd | „ | ... Maternal uncle, grandfather. |

Case of thirteen recoveries.—Mary A. B—, æt. 61, married. Mother, sister, and paternal uncles insane. Sister and uncle melancholy. The first attack occurred twenty-nine years ago. She has had no children. Her last attack was six years ago. A few weeks before the present attack, she “knew it was coming on.” She had pains in her head, was sleepless, and became, as usual, much depressed. The attack lasted about three months, and she has now kept well for over two years.

I might call attention to the cases in which the mother was insane while pregnant, but I have to consider this apart in another section.

I believe the fact is quite as well shown if one takes in the collateral neuroses, only here we have to consider special tendencies, as in epilepsy, that are rather to steady degeneration than to recovery and relapse.

This question will bear much investigation, and in looking at the histories of cases one is truly analysing the forces of nature. I am sure we shall, sooner or later, see that tendencies may be combined, and thus as much altered as chemicals are by union. I believe, and my belief is shared by Dr. Rayner, of Hanwell, that many of our so-called general paralytics are persons of a fibrous diathesis, liable to degeneration of kidneys and vessels. And if I look for any history of nerve disease in general paralytics, I look for apoplexy or paralysis of some form in the parents or relations.

Insanity on both father's and mother's side.

- | | | | | | |
|---------------|-------------|------------|-----------------------------------|--|----------------------|
| 1. Female ... | Melancholia | ... | Mother, father, brother | ... | Uncured. |
| 2. „ | ... | Mania | ... | Paternal uncle and aunt | ... Cured. |
| 3. „ | ... | „ | ... | Father and sister | ... Under treatment. |
| 4. „ | ... | „ | ... | „, maternal great uncle... | „ |
| 5. Male | ... | Delusional | { | Maternal grandfather and paternal aunt | } |
| 6. Female ... | Melancholia | { | Father, mother, sister, and aunts | } | Cured. |
| 7. „ | ... | „ | { | Paternal uncle, mother, sister | } |

Among the above we have cases of mania and of melancholia, nearly all having had several attacks.

It will be seen that a fair number have been cured, but those under treatment, I fear, will most of them be uncured ; and this brings me to another important point in those who have a strong family taint of insanity. Many such persons are born with peculiar tempers, and might be classed long as merely odd or hysterical. They have peculiar modes of thought and action, and have a new kind of mental balance that is not like our ordinary standard.

It is these that have to be discharged uncured, for though to appearances well behaved in an asylum, they are quite unfitted for the outer world. I shall add particulars of two such cases.

Those who have had long practical experience of asylums get to recognise peculiarities in patients that are almost always connected with inherited insanity, and yet cannot analyse the grounds of their belief.

Strong inheritance ; hysterical mania ; persistence of the state.—Mary B—, single, æt. 42. Mother died insane after an attack lasting six months. Father had two attacks, and died in the second. Maternal great uncle also insane. Grief at the loss of relations associated with the climacteric was the reason given for her breakdown.

She became silly, used to posture herself, cover her face, talk incoherently, refuse food at times, at others steal trifles. On admission she was very emotional, used to let her hair loose over her shoulders and walk about on her knees. She was simply a very affected, silly woman. She used to claim the doctors as relations, and deny her own friends.

She used to make mistakes about the sexes of patients ; thus one female patient, she said, was the Archbishop of Canterbury and her husband. For a time she kept in this state, doing no useful work and having no will to pursue anything steadily. She then became more negligent of herself, dirty in her habits, and had to be removed to another gallery. This punishment seemed to recall her somewhat, and from that time she has been clean. She has been for months now in one state. She is affected in manner, clean and tidy in person.

She is always writing letters to all sorts of people, asking

them to take her out ; she writes on scraps of paper. She collects small fragments of ribbon and thread, and is fond of gaudy dress. I fear there is little chance for her recovery.

She has been highly musical and still at times will play fairly well. I look upon it that she had a good general system, and that as long as it was in good order her unstable nervous system did its work, but when the climacteric came it received a shock from which it will never recover. She has attained an equilibrium, but it is on a lower level than the former one.

The second case is similar, but is in a younger patient, who had a more acute attack at the outset.

Rose C. C—, single, æt. 28. First attack. Father has been insane for twenty years. Mother at present insane. One sister was insane for three months, another died of phthisis. Before this attack she suffered from menorrhagia, but for three months has had amenorrhœa.

At first she became restless and unable to apply herself, then improved with change of scene, but relapsed. She fancied she was very wicked, and was violent if opposed. She slept and ate badly. She wandered without an object.

She had been engaged to be married, but this had to be broken off after the attack. She attempted to cut her throat, and to throw herself from the window.

On admission she was dull and melancholy, obstinately refusing food, saying she must not eat if she did not work, and she could not apply herself to any work. She was impulsive and silly.

She was fed with the stomach-pump for some time, but still refused food. Slowly she became more amenable to treatment, slept better, ate better and the menses reappeared. She became fat and strong, but instead of being herself again mentally she was fanciful and affected. She was too lazy to dress herself tidily, though she has a great idea of her beauty. She simply does nothing all day long but sit or lie in some comfortable place. Nothing will rouse her. If teased she says she shall tell the prince, or order out her horse-guards, but she says these silly things in an unmeaning way. She fancies she has ample means though her friends can barely clothe her.

So I fear she will remain a will-less fanciful woman, unfit

for the outer world, and yet hardly insane enough for an asylum.

That some forms of genius are related to insanity few doubt, but what are those forms and what is the relationship are difficult questions—questions not to be settled by one observer looking at one class of cases. I feel that I can hardly do justice to this subject here, but cannot leave it untouched.

The following records are facts that may be of use to others in pursuing this subject.

I believe that the genius of insanity is more related to the imagination than to any other of our mental functions. The artistic and the musical talents are associated in some cases with want of mental balance. The highest musical and the highest artistic talents are associated with high intellectual powers, but we shall see these talents in a less degree associated with feeble minds. I look upon precocity as the quality most allied to insanity. The old proverb of “A man at five, a fool at fifteen,” is true. I shall content myself with but few cases.

First we have the case of a woman who was a patient here, suffering from acute mania of the most noisy, obscene, and frolicsome description. She was witty, and rapid in thought and deed. She was discharged from Bethlem for special reasons, but eventually got well. She had a son, aged 6, who was a most accomplished pianist; and of a daughter, aged 5 years, the public prints wrote, “that she played selections from Bach, Schumann, Rameau, &c., and was enthusiastically applauded for her clever performances.” It is possible that her musical talent may persist, and either not leave enough mind for insanity, or be the counterpoise to keep what she has occupied.

Precocious literary ability ; insanity ; father extremely odd.—

E. S—, single, æt. 17. This girl had only been moderately educated, but before she was eleven years old wrote some very charming stories, some of which were published. She wrote so well that several distinguished men of letters took notice of her. For some time all went well, but pubescence appeared, and with it hopes and expectations. She received attentions from a gentleman, then soon followed the breakdown. She became sullen,

and generally confused in thought; she had a peculiar scared look, and moaned constantly that she was "Jesus' pet lamb;" she had a false idea of the value of things and collected rubbish. She improved somewhat, but was impulsive and odd. We were unable to follow the case further, as the father removed her for very strange reasons.

The next is a case of artistic genius associated with insanity. In the family there were three brothers and one sister insane. One brother was a criminal lunatic, and but for that would have been one of the most noted of our artists; the sister was insane and an artist. One brother was a most active, energetic man, a model of a skilled workman. He was otherwise well endowed mentally, having good taste and a splendid memory; he could repeat many plays of Shakespeare and much of Dickens' writings.

Thus in this family we have mixed up with insanity power of imagination, of execution, and of memory, and passing the border land of insanity we come to crime.

However strong the inheritance of insanity, it requires some exciting cause to develop the attack; this may vary to any extent, in some cases being physical and in others mental. I have noticed that similar attacks may occur in several of the same family, and I shall notice one or two cases where the self-same delusion was held by parent and child. Marcé has narrated a case in which twins had similar delusions and hallucinations.

Similar attacks of melancholia may occur in sisters and be associated in both with amenorrhœa, or both may break down at the climacteric.

A nervous mother may have a hysterical daughter, and I have seen several interesting cases in which similar causes have produced similar morbid mental states in parent and child. I have the records of some cases in which both mother and daughter had attacks of puerperal insanity.

I have collected and tabulated many of the puerperal cases in which we have a history of insanity in other members of the family.

- | | | |
|--------------------------|-----|---|
| 1. Female ... Delusional | ... | Mother, transitory mania after birth of this child. |
| 2. Male ... Dementia | ... | „ insane after childbirth for 12 years. |

3. Female ...	Melancholia	...	Mother insane after birth of first child.	
4. „ ...	Mania	...	„ „ „	This attack also after first child.
5. Male ...	„	...	„ „	while pregnant with this child.
6. „ ...	Senile dementia.	„	„	„ „
7. Female ...	Mania	...	„ „	after delivery.
8. Male ...	„	...	„ „	„ second and fourth delivery.
9. „ ...	„	...	„ „	„ delivery.
10. „ ...	Gen. paralysis	...	„ „	„ several deliveries, not after birth of this child.
11. Female ...	Mania	...	„ „	„ several deliveries.
12. „ ...	„	...	„ „	„ birth of this child.

Case of mania ; mother insane after the birth of this child.—

Jane A—, single, æt. 45. Family otherwise healthy. Other brothers and sisters quite strong mentally. Cause of insanity unknown. Has had in all four attacks from which she has recovered. She is always maniacal, more silly than violent, doing frivolous things and dressing untidily. The mother of this patient had enjoyed good health up to her last pregnancy ; she was then weak, and after delivery became insane. She died a few months after.

The next case is somewhat similar, only that the mother was insane while pregnant, and recovered ; but two of her sons have been insane.

Edward Mc—, æt. 61, married. First attack associated with general nervous decay. He is losing power in his lower extremities. His only brother died in an asylum. His mother when pregnant with this patient jumped into a pool of water and was nearly drowned ; she did this in consequence of delusions and melancholia. She recovered and lived in mental health till old age, when she became simple and weak-minded. Here, then, we have the distinct transmission of a tendency to nervous decay.

Case of mother and daughter both having puerperal insanity.

—Clara B—, married, æt. 27. Mother suffered from one attack of insanity following childbirth. This patient was perfectly healthy, and had no signs of insanity till delivered of her first child. All went well till fourteen days after, when she

became sleepless and had many delusions. She was then violently maniacal. Like her mother she recovered, and has kept well now nearly three years.

We have one or two cases on our list in which two brothers have received the disposition to insanity through the puerperal mania of the mother.

Case of insanity of mother and two sons.—Samuel B—, married, æt. 31 years. Mother was insane while pregnant with this child. Moreover, she was insane three weeks previous to the delivery of an elder son, who has also been insane, the only other member of the family so affected. The mother's insanity continued off and on for seven years.

Case of puerperal mania in the mother; erotic mania in the daughter.—Ellen S—, æt. 26. Mother suffered from puerperal insanity and died. This daughter is of highly nervous temperament, talented, tasteful and pleasant when sane, but easily upset, especially by ovarian or uterine troubles, and then she is most violent and maniacal. She has had several attacks, and will probably continue to have them.

We have had one case lately in which the mother suffered from puerperal insanity and the daughter had insanity associated with ovarian dropsy.

Two cases of single girls, daughters of women who were upset by puerperal conditions, are of great interest. We have other cases in which the single sister has suffered from hysterical mania or simple hysteria and the married one has had puerperal insanity. Such cases support the idea that not only are patients specially predisposed to neuroses, but that they are specially liable to suffer if there be excitement or derangement of the sexual organs, this being eminently true of the female sex because so much more of their life interest is in relation to sexuality. I have failed to find similar causes in men.

Father and daughter with the same delusions.—Elinor T. V—, single, æt. 26. Father said to have had brain-fever, but certainly was insane. Well educated, of quick temper, nervous, and excitable. Acted as governess for six years, but was

always changing her situations. She became dull and melancholy, and then got strange ideas, thinking herself a great person. She used to suffer from hallucinations of hearing. She at one time used to think she was Jesus Christ, and at the same time her father used to believe he was the father of Jesus Christ. The character of the delusions and the general form of insanity were alike in father and daughter.

Uncle and niece living together having similar delusions.—Sarah C—, single, æt. 31. First attack. No known cause unless it were a love affair. She either was, or supposed she was, looked upon favorably by a nobleman. Whether or not there was any truth in this at first, in the progress of her case her delusions always related to seducers and followers. She thought people were leagued against her, and at times fancied she was the Queen in this delusion, while in many similar ones her uncle supported her. He is at present in another asylum. I may be taking this agreement of uncle and niece for more than it is worth, but still think it noteworthy, at the same time guarding my readers against the possibility of mistake. In asylums one of the most marked features in cases suffering from apparently trifling mental disease is their want of judging power, so that though fairly reasonable themselves they cannot judge of the amount of reason in their companions. This allows many to be led about by the stronger willed, and thus delusions of one patient may be maintained by another.

The taint of insanity and its tendency to reappear may not only miss one generation and reappear in the next as shown by many of our cases, where grandparents or granduncles and grandaunts have been insane, and the parents sane; but as might be expected it may occur in the parent who recovers, and yet after cure begets a child who may be an idiot or go insane sooner or later. The child may be insane or may be born an idiot before the parent has become insane. As I said before, the children born after an attack of insanity seem to be more susceptible than those before, and those begotten nearer the attack more than those at a greater distance.

I subjoin a list of cases in which the parents recovered, but passed on the disease to their offspring.

1. Female, æt. 58. 1st attack. Father recovered from slight attack. Uncured. This patient was an authoress of good parts. She suffered from delusional insanity.
2. Female, æt. 17½. 1st attack. Mother recovered. Cured. This patient was emotional and suicidal.
3. Female, æt. 52. 3rd attack. Father had his first attack, and recovered a year ago. Cured. Emotional; melancholy; delusions about the Holy Ghost.
4. Female, æt. 29. 1st attack. Mother recovered from mania. Uncured. Dementia appeared and steadily progressed.
5. Female, æt. 18. 1st attack. Father insane 20 years ago. Cured. The patient's father was ill nearly a year, and this brings us to the point that this daughter was begotten soon after his recovery. He had no other insane children.
6. Female, æt. 23. 1st attack. Mother insane in her youth. Cured. Both mother and daughter had similar attacks at similar ages.
7. Female, æt. 24. 1st attack. Father insane after daughter. Cured. Both were melancholy and both recovered.
8. Male, æt. 41. 1st attack. Mother insane; recovered. Uncured. Melancholy, suicidal, ? syphilis also.
9. Female. 1st attack. Father had an attack 14 years after his daughter. Cured. Both recovered.
10. Female. 1st attack. Father had several attacks. Recovered.

I have said that I would divide insane patients into those with general paralysis and those without it, as I considered that between these classes grand distinctions exist.

Among these distinctions one generally places the less tendency to inheritance in general paralysis, and this is a most important question; if general paralytics have slight or no tendency to pass on this disease or any nervous disease, we should inform our clients that there is but small danger in marrying into a family where the head has died of general paralysis. My belief is that a fair number of general paralytics have some tendency to neurosis, that in fact they are bound to die by their nervous systems, and that hence they may transmit a slight taint, but that in many more cases general paralysis has nothing to do with insane inheritance. It is a disease of the active and over-energetic.

In the table on page 64 is shown the form of disease exhibited by those having insane relations; and it will be seen that there are only eleven general paralytics amongst them.

In 1873-6 we admitted seventy-six undoubted general paralytics and these had eleven insane blood relations, that is,

17 per cent.—less than half the percentage in the case of ordinary admissions. Of these, six were direct, that is, parents or grandparents, and five collateral : thus made up—three brothers and sisters, and two cousins or more distant relations. They include one brother who committed suicide, one grandfather an insane drinker, one brother an idiot, and one whose mother died of paralysis. So that I think I am justified as far as my limited but carefully collected data go, in saying that general paralysis is less an inherited neurosis than other mental diseases.

I might be expected to refer to the inheritance in idiocy, but we have no experience directly of idiots in Bethlem, and so I must content myself with very few remarks. We know that in certain families there is a special tendency to the appearance of idiocy, one child after another being born who becomes an idiot, and yet the parents may be sane themselves. Such cases are paralleled by those I have mentioned, where sane parents have three or four children, all of whom become insane sooner or later. Whether consanguineous marriages alone can produce it I doubt; there must be some other element present. We have yet to learn what that element is. As to my experience here I can only say that idiots and insane people are of the same stock sometimes, but not often. I have not half a dozen cases in the five years in which there was an idiot related to any of our patients. We had one man whose eldest son was an idiot, another whose sister was an idiot, and another whose brother was an epileptic idiot. Some of our admissions, however, make one think there is a connecting link; thus, we have patients admitted about twenty years old who, though they should have done something for their livelihood, have been considered too stupid; they have at puberty or soon after become violent and maniacal. With such a history no real good will be obtained; the dull nervous system is unstable at times and may be upset.

An important question in regard to family taint is the chance of recovery. My impression is that many, I might say most, cases with family taint of insanity recover one or more times, but as they relapse our statistics would have to be most elaborately kept to point out the just proportion of cures and relapses. As most such cases come back to us at Bethlem, and finally leave us uncured, I fear my tables do not quite

represent my belief. I add the list of results in patients with insane inheritance during four years, not including 1876, which as yet can only figure among the admissions :

	Males.	Females.	Total.	Percentage.
Cured	49	114	163	54·5
Uncured	35	49	84	28·1
Died	14	6	20	6·7
Under treatment or re- moved by friends }	14	18	32	10·7
	112	187	299	100·

In my next table I place the number of patients with insane inheritance who have suffered with one or more attacks, merely saying that a large number of the patients admitted in their first attacks will be seen again.

	Male.	Female.
First attack	108	155
Second or other	35	77
	143	232

Before concluding, I would add a few remarks on other neuroses, not that I have been able to connect all these branches of disease in my own patients ; but I hope as occasion serves to collect and record the relationships of these diseases to insanity. I have neglected chorea, as I have not been sufficiently careful in collecting histories till recently. Chorea sometimes occurs with insanity, and I have seen at least one case in which the mind like the muscles went in jerks. A fright that might produce dementia in one neurotic subject will produce chorea in another. Several of our cases have had distinct attacks of chorea in childhood and insanity later. Neuralgia is treated vaguely as a neurosis ; some forms of headache are allied to insanity. At present we have three cases in Bethlem who have suffered much from headache, and all have vitiligo plana in both eyelids. This may mean nothing, but is a fact, and I record it.

We constantly talk of the neurotic tree, and I shall conclude by tracing a few cases in which the branches can be well seen. In one case the mother had insane longing during pregnancy, her eldest daughter had two attacks of puerperal insanity, one

son was melancholy for a time, another was in an asylum for hypochondriacal melancholy. One patient's father was insane and his brother epileptic; he was himself for a long time vicious in life, but at last broke down in insanity. We have already seen how insanity and suicide may appear and reappear in a family. In another case the insanity of a father and sister is represented in our patient by drink-craving. In one case two sisters are insane; one brother is without principle or self-control, another a martyr to neuralgia, and a niece a somnambulist. In another all sense of right and wrong seems to be lost, as the result of insanity in both parents. Thus the fearful taint changes constantly, but still marking its dangerous nature, a taint that may lead to crime or to genius.

XANTHELASMA

(VITILIGOIDEA OR XANTHOMA).

By P. H. PYE-SMITH, M.D.

IN the seventh volume of the second series of these Reports (1851), the late Dr. Addison and Dr. (now Sir William) Gull described and figured five cases of a remarkable disease of the skin, to which they gave the name *Vitiligoidea*, from a belief "that Willan would have included the cases there recorded under Vitiligo or an allied affection." They distinguished two forms in which it occurs—"yellowish patches, of irregular outline, slightly elevated and with but little hardness;" and "tubercles, varying from the size of a pin's head to that of a large pea, isolated or confluent." When both forms are combined in the same individual, "we are able," they add, "to trace the connection of the two through an intermediate series of gradations, which clearly demonstrate their essential relations." They also observed the remarkable connection of this affection of the skin with jaundice.

Of the two forms of disease thus described, that which was called *Vitiligoidea plana* had been previously figured by Rayer in the atlas of his '*Traité des Maladies de la Peau*' (1835), as "plaques jaunâtres des paupières," with this short description:—"On observe quelquefois, sur les paupières et dans le voisinage, des plaques jaunâtres semblables pour la couleur à la peau du chamois, légèrement saillantes, molles, sans chaleur ni rougeur, et quelquefois disposées d'une manière assez symétrique."

Examples of the simple or macular form of the disease affecting the eyelids, and usually not associated with jaundice, have been described by Bärensprung in 1855, and by many other writers at home and abroad since. Mr. Hutchinson especially, in the fifty-fourth volume of the 'Medico-Chirurgical Transactions,' tabulated as many as thirty-six observations of his own. But cases of the disease in which nodules (*Vilitigo tuberosa*), as well as flat patches (*V. plana*) occur, and in which the affection is not confined to the eyelids (*X. multiplex*), are much less common, so that it is possible to bring all those yet recorded together for comparison. The attempt seems the more appropriate to these Reports because it so happens that most of the cases have occurred in Guy's Hospital, and we have an excellent series of drawings and wax models to illustrate them. Dr. Pavy's case was the first which resembled the original ones, and the first of which an histological account was given. The sequel of this remarkable case (No. 4 in the table) was given with two others in three papers by Dr. Hilton Fagge in the 'Pathological Transactions,' which greatly added to our knowledge of the disease. Dr. Murchison and Dr. Wickham Legg in this country, and Waldeyer and Kaposi in Germany, have made other important contributions to the subject, so that there is now material for the inquiry of sufficient quantity and of unusual quality.

I will first briefly discuss the most important cases in chronological order.

Of the five original cases of Addison and Gull, three are typical examples of the disease.

Mrs. B—, æt. 42, who had suffered from jaundice with pain in the right hypochondrium for fourteen months, was affected with yellow patches on the eyelids and streaks on the palmar surface of the palms and fingers. The disease remained stationary until death, which happened four years after the appearance of the jaundice. Unfortunately there is no record of a post-mortem examination. The case is illustrated by two models now in the Guy's Museum (No. 1 in the Table of Cases at the end of this paper).

E. P—, æt. 38, was jaundiced, with an enlarged and tender liver, and, after it had lasted more than a year, was admitted

under Dr. Hughes, with marked maculæ of the eyelids and the palms, and nodules on the elbows and knees, on the dorsum of the fingers and toes, and on the ear. A beautiful coloured drawing of the elbow and ear illustrates this case, and another of the hands, taken a year later, appeared in the next volume of the Reports; four models are in the museum, two of the elbow and hand taken at the time, and two of the same parts taken seven years later, when both the nodules and the maculæ had increased (see Table I, No. 2). The further progress of the case is unknown.

Mrs. J.—. æt. 43; the jaundice came on gradually after cessation of the catamenia. Xanthelasma appeared in its commonest and most characteristic form of maculæ on both eyelids, beginning in the inner canthus, and, as Mr. Hutchinson has pointed out, in the *left* eye. It had spread to the side of the nose and cheeks when the coloured drawing which illustrates the paper was made (No. 3). Of this case we have no model.

The other two cases of the original memoir are probably not genuine. The first occurred in a young woman without apparent cause. It extended across the nose, and slightly affected both cheeks, and consisted of “shining tubercles varying from the size of the smallest papulæ to that of ordinary acne. They were of a lightish colour, with here and there superficial capillary veins meandering over them, giving them a faint rose tint. The changes they underwent were very slow; while some advanced, others subsided.” The further course of the case was not observed. This may possibly have been lupus erythematosus, but certainly was not xanthelasma. A model taken from this patient was marked as doubtful in the second edition of our ‘Museum Catalogue’ by Dr. Habershon in 1854, and is altogether omitted in the third edition lately published by Dr. Fagge (Table II, No. 1).

The last of the five original cases occurred in a man aged 27, suffering from diabetes. An eruption appeared somewhat suddenly on the arms, at first apparently of a lichenous character. In the course of ten days it had extended over the arms, legs, and trunk, also over the face and into the scalp. It consisted of scattered tubercles of various sizes, some being as large as a small pea, together with shining colourless papulæ. Some looked as if they were beginning to suppurate, and many were

not unlike ordinary molluscum (contagiosum); but when incised with a lancet, they were found to consist of firm tissue, which on pressure gave out no fluid save blood. They were of a yellowish colour, mottled with a deepish rose tint, and with small capillary veins here and there ramifying over them. They were accompanied with a moderate degree of irritation. Hence the apices of many of them were rubbed and inflamed. On its first appearance some suspected it to be a secondary venereal affection, but there was nothing in the case, nor indeed in the character of the eruption, when carefully examined, to support this view. The eruption continued almost stationary from the end of January to the beginning of March, when many of the tubercles began to subside, leaving no obvious change in the texture of the skin. At the end of March the patient left the hospital, and the further course of the case was not ascertained. The rapidity with which the eruption appeared, its locality and its rapid disappearance, seem to me almost conclusive against its being a true case of xanthelasma; and Dr. Fagge, taking the same view (see his paper in the 19th vol. of the 'Pathological Transactions'), has excluded the model from the series of xanthelasma (Table II, No. 2).

The next case recorded is a classical one. It was published by Dr. Pavy in the volume of these Reports for 1866, and afterwards followed up and traced to its termination by Dr. Fagge. It was depicted at various stages in its course, and the post-mortem appearances of the liver, as well as the histology of the cutaneous disease, described. Xanthelasma existed in its double form of maculæ and tubera, and occupied not only the eyelids, but the ears, the hands, and other parts. The patient, a woman of 39, was also affected with jaundice. Two years later Dr. Fagge sought out this patient at her home, and found the liver increased in size, the jaundice deeper, and the patches and nodules larger than before. She then became an out-patient, and improved in general health under sarsaparilla, nitro-hydrochloric acid, and taraxacum. She died after being jaundiced about six years, having before suffered from an attack which lasted about ten months. At the post-mortem examination the old xanthelasmic patches around the eyes were still plainly marked, but the nodules on the hands had become

much less distinct; patches were found in the mucous membrane of the larynx and trachea, also in the intima of the aorta and pulmonary artery, and there was a large number of minute white grains upon the surface of the spleen. The liver weighed over sixty-six ounces; its surface was smooth, but on section the lobules were separated by a transparent grey-looking material, so that they projected on its surface exactly like the nodules in an ordinary case of cirrhosis. The immediate cause of death was hæmorrhage from the stomach. The patient, unlike Dr. Murchison's (*vide infra*), had not been a spirit drinker (Table I, No. 4).

The next genuine case of xanthelasma occurred at Guy's Hospital in 1864, under the late Dr. Barlow, but it was only published by Dr. Fagge in the paper which contained the second series of drawings of Dr. Pavy's case in the 'Pathological Transactions' for 1868.

R. C—, æt. 45, suffered from jaundice, with anasarca and ascites, and had marked xanthelasma of both eyelids. She was tapped while in the hospital, but ascites returned, and she was unfortunately removed from the hospital shortly before her death, so that no autopsy was made (Table I, No. 5).

Another case of Dr. Barlow's, of which a model was taken as one of xanthelasma tuberosum (No. 384 in the present Catalogue), occurred in a youth of 18, who was the subject of jaundice. The model shows small papules on the back of the hand, which are unlike any other case of the disease. The lad was an out-patient and the account of the case imperfect, so that the model is marked with a query in our last Catalogue, and its true nature must remain very doubtful (Table II, No. 3).

An undoubtedly genuine case was admitted into Guy's Hospital under Dr. Habershon in February, 1868, and was reported by Dr. Fagge in the 19th volume of the 'Pathological Transactions.' Jaundice had existed for more than a year, and the liver was considerably enlarged and tender. Xanthelasma appeared on the eyelids as maculæ, which slowly increased, and there was some indication of commencing change of the same kind on the hard palate and the gums. The history

seems to point to cirrhosis, with perhaps syphilitic nodes of the liver¹ (Table I, No. 6).

In 1869 Dr. Murchison published in the 20th volume of the 'Pathological Transactions' a case of xanthelasma planum of the eyelids, presenting the characteristic features, which occurred in a man of 41, who had been jaundiced for eighteen months, and who died soon after coming under observation. The post-mortem examination, the first which had been recorded, showed that the jaundice was due to a chronic interstitial hepatitis, with considerable hypertrophy, so that the liver weighed more than eighty ounces. The man was a drinker, and the enlarged spleen, as well as the great increase of fibrous tissue in the portal canals, seem to point to this having been a true case of cirrhosis, although there was no appearance of contraction of the organ. That a cirrhotic liver may be increased in size, even when the disease has existed for a long time, is certain, and when cirrhosis is associated with jaundice, "as a rule the liver is not contracted, but increased in size"² (Table I, No. 7).

In the same year, 1869, Dr. Frank Smith, of Sheffield, published a well-marked case of this disease, under the name xanthoma or vitiligoidea, in the 'Journal of Cutaneous Medicine.' It occurred in a woman, aged 28, who had suffered from jaundice for five years. The disease occupied the eyelids and the lines of the palm of the hand in its macular form, and appeared as nodules upon the back of the hand, fingers, elbow and feet, as well as at one point of the mucous membrane of the gum. This case ultimately proved fatal in 1872. The details of the post-mortem examination will appear in the 'Pathological Transactions' for the present year; but I may here state that the liver was enlarged and the hepatic cells extensively destroyed (Table I, No. 8).

¹ I find that this patient was again in hospital under Dr. Wilks, December, 1868, to February, 1869. He had then xanthelasma of the upper and lower lids on each side and of the mucous membrane of the mouth. Liver large, with rough surface and rounded edge. Spleen big from previous ague. Jaundice with clay stools. Xanthelasma appeared on the right carunculus. He went out much improved under Pot. Iod. gr. xv, t. d. s.

² See on this point Dr. Fagge's remarks in vol. xx of these Reports, p. 163.

In 'Virchow's Archiv' for 1871, vol. lii, are two papers on xanthelasma. One is by Professor Waldeyer (page 318), who gives an excellent histological account, with drawings, of the disease, which will be referred to below. His case was an ordinary one of palpebral xanthelasma unassociated with jaundice (Table I, No. 38).

The other article (page 504), by Professor Virchow himself, describes, under the name "*Xanthelasma multiplex* (*Molluscum lipomatodes*)," a remarkable case of the late Professor von Graefe. A man, age not stated, had come to the great oculist of Berlin in June, 1867, with a singular affection of both corneæ. For a year past they had become gradually covered with small yellow spots, and in the right eye these had formed a yellowish, somewhat raised tumour, which covered the greater part of the cornea. Von Graefe stated, when exhibiting the patient to the Medical Society of Berlin, that he had seen two cases before of the same kind, in which both corneæ had become overgrown by similar tumours. Besides the affection of the eyes there were a number of small nodules scattered over the skin, either separate or confluent, so as to form masses varying from a quarter of an inch to an inch or more in diameter. They began as flat, lenticular, soft thickenings, and were characterised by a remarkable colour, which may be described as a deep yellow brown. The parts most affected were the popliteal regions, and a coloured drawing of the left ham accompanies the paper. The eyelids were not specially affected. There is no statement as to the occurrence of jaundice, so that we must assume it was absent, though the colour of the chromo-lithograph would not be inconsistent with the presence of an icteric tinge. The disease was called *molluscum* by Von Graefe, and its identification with xanthelasma rests first upon the colour of the nodules, which, if the plate referred to is a correct representation, is totally different from that of xanthoma, and secondly upon the histological examination by Dr. Leber, which agreed with the description just referred to by Waldeyer (Table II, No. 4).

Having read this case with sceptical interest, I was attracted by a paragraph in the 'Berliner klinische Wochenschrift' for the 20th July, 1874, in which Dr. Hirschberg describes a case as *Xanthelasma planum et tuberosum*, which proved to be

undoubtedly that of Von Graefe's patient, described and figured by Virchow. The man, then aged thirty, was from eight years old the subject of a remarkable affection of the arms and legs, which had gradually increased to its present dimensions. The skin is described (1874) as in many places deeply pigmented, and also covered with flat yellow patches or with raised nodules which are most prominent about the ham and the elbow, some of them separate, others clustered into great masses. The apparently smooth growth which had formed on the cornea of the right eye in 1864 had been removed by Von Graefe in the following year, and again on its return two years later (1867). The flat yellowish spots on the left cornea, which Von Graefe regarded as early stages of the same disease, were still in the same condition, though the tumour of the right eye had returned a second time, and had been lately removed by Dr. Hirschberg. He found that the new growth had invaded the whole of the cornea and filled the anterior chamber. On section it showed a tissue rich in cells of varied size and form, many of which were in a state of fatty degeneration. It was said to agree in structure with the cutaneous nodules, one of which was excised at the same time and examined by Dr. Hirschberg. He describes it as consisting of interlacing fibres with abundant oil-drops.

As I think we shall see, in considering the histology of xanthelasma, the elements which compose the nodules are too general to afford diagnostic characters, but apart from this consideration the whole course and natural history of Von Graefe's case seem to me to show a wide divergence from that of xanthelasma. Its very early origin, its extremely chronic course, its totally different local distribution, and especially its quasi-malignant invasion of the eye, are all very distinct from the characters of xanthelasma. Moreover, the absence of the maculæ which in all undoubted cases accompany the nodules, no less than the difference in colour and general aspect, would, I feel sure, prevent any one conversant with the disease from models and coloured drawings of the characteristic cases from recognising the plate in the 'Archiv' as a representation of the disease figured in these Reports by Addison and Gull.

In 1871 a woman, æt. 48, appeared among my out-patients

who was suffering from jaundice with enlarged liver, and had marked early xanthelasma palpebrarum. She afterwards became an inmate of Guy's Hospital, under the care of Dr. Owen Rees. Two years before admission, while pregnant with her thirteenth child, she became deeply jaundiced. There was also anasarca, which disappeared after delivery, but the jaundice persisted with great itching and emaciation.

On admission there were characteristic patches on the inner angles of the upper eyelids, and smaller ones beginning on the lower ones. The liver was greatly and uniformly enlarged, smooth, and rather tender. The spleen was also enlarged, apparently as the result of ague from which the patient had previously suffered. The fæces were light coloured, but there was little or no bile in the urine, which was also free from albumen. She improved under quinine and sarsaparilla (Table I, No. 9).

Next year the following case occurred in Dr. Moxon's ward. A man, æt. 32, had been attacked with colic and jaundice about eight months before admission. Xanthelasmic patches were present on the hands, in the palms, and the bend of the knuckles, on the ears and cheeks, and slightly on the eyelids, to some extent also on the back, and largely in the skin of the scrotum. At the post-mortem examination were found in the mucous membrane of the trachea "very obvious opaque patches, as if white paint lay just under the surface." Similar maculæ were observed in the dilated bile-ducts and in the capsule of the spleen; there were none on the urinary mucous membrane or the rest of the serous membranes. The liver was large and finely lobulated from very early cirrhosis. The obstruction was a simple fibrous nodule, "closely resembling constriction of the urethra," situated at the junction of the right and left hepatic ducts. Before death bleeding took place from the nose, the intestines and the bladder, and extensive hæmorrhage was also found in the pelvis of the kidney and among the muscles of the thigh and arm. It is also worthy of remark, in connection with these hæmorrhages and the coma which preceded death, that the liver-cells were found to be more or less broken down and tyrosin was present in the hepatic tissue (Table I, No. 10).

During the summer of the same year 1872 there lay in the same ward with Dr. Moxon's patient one of my own who was also the subject of jaundice and xanthelasma. The preceding October she had been attacked with pain in the region of the liver, and next day jaundice appeared with absence of bile in the stools. From this attack she soon recovered, but was again jaundiced in November without fresh pain; and although she once more regained her natural complexion, the urine continued dark. Two days before admission she had a third attack of jaundice, with a return of the pain she had suffered in October. When I saw her the liver was somewhat enlarged and tender; there was a slight, raised, flat, whitish-yellow patch on the right upper eyelid, running a little more than half an inch outwards from the inner canthus and one tenth of an inch broad. A corresponding patch was beginning in the left eyelid. Smooth, narrow lines, which looked almost white in contrast with the jaundiced skin, occupied the creases of the palmar surface of the hands and fingers. There was nothing of the kind on the feet or other parts of the body. I regarded the case as one of obstructive jaundice from gall-stones, and while in the hospital she had a fresh attack of pain with increased depth of colour. She then passed some altered blood by the bowels, but no calculus was discovered. She gradually improved under treatment, and regained her natural colour, but the yellow patches slowly spread. Though there was abundance of bile-pigment in the urine, 1400 c.c. evaporated down gave no evidence of the presence of biliary acids, nor was either leucin or tyrosin present. She left the ward in July, but the following September was readmitted under Dr. Wilks with severe erysipelas, and died in a few days. The bile-ducts were found greatly dilated, and there was a calculus in the gall-bladder. The liver weighed 48 oz., and at first appeared perfectly normal in texture; but after hardening it and making sections, I found distinct increase of connective tissue amounting to a slight degree of interstitial cirrhosis. Patches precisely like those on the eyelids and hands were found in the mucous membrane of the dilated hepatic ducts and on the surface of the spleen (Table I, No. 11).

In the following case, which I first noticed in the same year,

there was evidence of the cause of jaundice, not only from the general features of the case but from actual passage of calculi.

A woman, æt. 31, was under Dr. Rees' care during August and September, 1872, suffering from jaundice, which was supposed to be due to gall-stones. She had previously had ague, and her spleen was enlarged. I was registrar at the time, and found the liver to be large, smooth, and tender; the skin and conjunctiva deep yellow and irritable; the urine full of bile-pigment, and the fæces light. There was then no xanthelasma. She had been in the Clinical Ward a few months before with a similar attack. She was admitted a third time in 1874 under Dr. Habershon with evidence of a return of impaction of the common duct. There was then a small patch of xanthelasma on the lower lid of the right eye. She was last seen in the hospital in August, 1875. The skin was then deeply jaundiced and the liver was enlarged, with the same pain and other symptoms, which were relieved as on previous occasions by the passage of gall-stones (Table I, No. 12).

Still in the same year I had an out-patient affected with jaundice from gall-stones, in whom xanthelasma afterwards appeared. S. B—, a woman who was forty-eight when she died, was, like the last patient, an inmate of Guy's Hospital on several occasions. She was first under my care as an out-patient, for ten weeks in the year 1872, with jaundice and enlarged liver, probably due to gall-stones. This was already the third attack. There was then no xanthelasma. I admitted her under Dr. Rees' care, and she went out much relieved. The next year she was under Dr. Moxon for a similar attack, when he noted that the liver extended more than six inches below the ribs, and that the distended gall-bladder could be felt. There was pruritus, and a patch of vitiligoidea plana was present at the inner canthus of the left eye. The jaundice disappeared, and she went out again much better. But in July, 1874, she was readmitted into Dr. Habershon's ward with a return of her disease, which had set in a fortnight before with jaundice, vomiting, and severe pain. After much suffering, and surviving an intercurrent attack of pneumonia, she died in October. The immediate cause of death was pyæmia from ulcerative endocarditis. There was purulent meningitis, purulent iritis, and vegetations

on the mitral and aortic valves, the latter of which were ulcerated. The spleen was soft and large, weighing 18 oz. The liver weighed 87 oz., and its ducts were dilated throughout. The gall-bladder contained as many as ten calculi, and another was impacted in the common duct. The liver was in a state of early cirrhosis, no doubt the result of occlusion of its duct, as in Case 11 (Table I, No. 13).

Dr. Wickham Legg brought before the Pathological Society in 1874 a case of multiple xanthelasma with jaundice which occurred at St. Bartholomew's Hospital. The patient was a man, æt. 35, who had been jaundiced more or less for nearly a year before admission. The liver was enlarged and smooth. There was well-marked xanthelasma planum of the eyelids, with minute yellow spots of apparently the same character on the conjunctiva and the mucous membrane of the mouth and tongue. Similar yellow patches appeared later on the palms of the hands, the left elbow, the right ear, and one side of the nose. The patient died in December, 1873, and the jaundice was then found to be due to hydatid cysts, which had compressed the hepatic duct. There were then xanthelasmic patches on the scrotum and on the flexures of the neck, elbows, shoulders, and hands, in addition to those mentioned above (Table I, No. 14).

In the same volume of the 'Pathological Transactions,' p. 259, Dr. Legg published a case which occurred in Dr. Andrew's practice. The patient, a woman æt. 36, began to turn yellow more than two years before, in consequence, she believed, of a quarrel with her husband and a great fright. During this time she had been subject to flooding. Spots had appeared for about six months on the elbows, the palms of the hands, and the soles of the feet. She suffered much from the pruritus of jaundice; the urine was habitually high coloured and the fæces light. After passing something hard (? a gall-stone) her complexion became lighter and the spots less marked. A drawing was made of the case, which showed the clusters of xanthelasmic spots to be most prominent on the ears, the eyebrows, the alæ of the nose, the joints of the fingers, and the olecranon. There were also two yellow spots on the gums (Table I, No. 15).

In November, 1875, a sailor, æt. 57, who had suffered for six weeks with jaundice, accompanied by pruritus and slow pulse, came to me as an out-patient. The liver dulness was normal; there was no pain and no history of previous illness, except an attack of erysipelas twenty-five years before. The urine was dark, and the stools clay-coloured. I thought the case one of simple jaundice, but as he did not improve I admitted him into Dr. Pavy's ward, which was then under my charge, in the beginning of the following January. I then found the liver much enlarged, but smooth; the gall-bladder to be felt distended below its edge. While in the hospital he had a smart attack of facial erysipelas, from which he recovered, without the jaundice being affected. The liver dulness then diminished, the skin became less dark and the urine lighter, but although there was still no pain he was steadily diminishing in weight, and a patch next appeared on the lower lid of both eyes. The liver dulness became normal, the colour of the skin improved, and the urine lost its bile-pigment. On the 18th of February the urine was again darker and the liver dulness extended an inch below the ribs. Three days later the jaundice, pruritus and enlargement of the liver were almost what they were on his admission. The notes taken during the rest of the patient's life do not show any marked change until the 5th of March,¹ when the temperature rose and signs of pleuro-pneumonia appeared, which proved fatal five days later. At the post-mortem examination the cause of the jaundice was found to be a carcinomatous tumour growing at the junction of the pancreatic and common bile-ducts. There were several secondary growths in the liver, and the hepatic and pancreatic ducts were both dilated. Hepatisation of the left lung was the only other internal lesion. Xanthelasma of both eyelids was well marked, but had not invaded other parts of the skin nor the internal organs (Table I, No. 16).

I am indebted to the kindness of Dr. A. W. Foot for a reprint of the following case of xanthelasma associated with jaundice which was published in the 'Dublin Journal of Medical Science' for May, 1876. The patient was a woman æt. 41, who was admitted into the Meath Hospital, Dublin, in November, 1875. She had

¹ While in hospital the amount of urea passed never exceeded 140 grains per diem.

then been deeply jaundiced for nearly three years. *Xanthelasma* had existed for eight or nine months, presenting itself first upon the upper eyelids, then on the lower lids, on part of the skin of the neck, the flexures of the elbows and wrists, and the creases of the palms and soles, as well as in the mucous membrane of the mouth. The jaundice had begun without suffering, but during the third year of its continuance she frequently suffered from severe attacks of pain in the right hypochondrium. The pain became very severe after she was admitted into the hospital. She had never suffered from sick headache or "bilious attacks," and though she admitted that she liked a glass of whiskey did not appear to have drunk to excess. The urine was the colour of porter, and the stools were usually white, though at the time of admission they contained some colouring matter. Pruritus was severe and general. The patient continued under observation for more than a month, when, being relieved of the pain and tenderness in the hepatic region, of irritability of stomach and anorexia, she returned home. The jaundice was still considerable, though less so than before, the urine dark and the *fæces* imperfectly coloured. "From the permanency of the jaundice, the smooth enlargement of the liver, the absence of symptoms of obstruction of the portal vein, and the preservation of her flesh and strength for three years, I concluded that the hepatic disturbance arose, not from cirrhosis or malignant disease, but from a chronic obstruction of the biliary outlets. The urine was on several occasions examined for tyrosin and leucine, but notwithstanding the most careful preparation and evaporation of as much as thirty ounces I never succeeded in finding either. There was temporary albuminuria, a considerable excess of uric acid and frequently of oxalate of lime." The average rate of the pulse was 83 (Table I, No. 17).

In the second edition of Hebra's '*Hautkrankheiten*' by Kaposi appear the following five cases of *xanthelasma*.

A lady, *æt.* 40, had a large bright yellow patch on the right side of the neck and also on the cheeks. She had never suffered from jaundice, but a year later appeared in Professor Hebra's consultation room on her way to Carlsbad, having become the subject of intense jaundice in the interval. The patches of *xanthelasma* were larger than before (Table I, No. 22).

The second patient, a man *æt.* 35, had a patch of xanthelasma planum on the side of the neck without jaundice (No. 23).

The third, a man *æt.* 40, had a similar but smaller patch on the lower eyelid, also without jaundice (No. 24).

The fourth patient was a woman *æt.* 40, who had suffered from jaundice for seven weeks when only sixteen years old, while the xanthelasma appeared only when she was thirty-six, so that one can scarcely associate the two affections. It was of the common macular variety, and occupied both eyelids. She was also the subject of syphilis (No. 25).

The last case was that of a young man who had never suffered from jaundice, and who presented himself with papules on the skin at the root of the penis, which resembled grains of wheat. This is all the account given, and there is nothing but the opinion of the writer to identify these papules with xanthelasma. Without presuming to give the affection another name we may hesitate to admit it with the other cases (Table II, No. 5).

It will not be necessary to go minutely into the remaining cases on record of xanthelasma not associated with jaundice. Reference to them as well as to a few unpublished of my own will be found in Table I.¹ So far as I have been able to collect them they are all examples of the macular form (xanthelasma planum), and all are confined to the eyelids. Some of the earliest cases recorded were three by Bärensprung, and others have been reported by oculists in Germany, by Geissler, Hirschberg, and Manz. I have already referred to Mr. Hutchinson's thirty-six cases, and to Dr. Church's remarkable series of cases in one family.

The only danger in the diagnosis of these simple cases of *X. palpebrarum* is in admitting cases of milium or some other form of affection of the sebaceous glands. Neumann gives an excellent woodcut of the anatomical condition found in the latter disease ('*Lehrbuch der Hautkrankheiten*,' S. 59, Fig. 10), and from this it is clear that it differs from xanthelasma as much in its histology as in its origin and progress. Among

¹ While these pages are passing through the press the notes of another case of Dr. Fagge's, which has just left the hospital, have been kindly sent me. I have included it as No. 18 in Table I. The chief peculiarities were the freedom of the eyelids and the severe darting pain in the affected hands.

Mr. Hutchinson's cases some are included which are clearly of sebaceous origin. Of the figures which accompany his paper ('Med.-Chir. Trans.,' vol. liv, pl. iii) the third is a typical case of xanthelasma, but fig. 3 represents obstruction of a sebaceous gland, and fig. 1 serous cysts of apparently glandular origin. These cannot be reckoned with xanthelasma if we admit any other criterion besides their locality. So in the list of cases given, Nos. 5 ("a single small round spot on left upper lid, yellow, with a black speck in the middle") and 16 ("a single flattened papule as large as a pea on left upper eyelid, a black point at centre"), with some others, must, I venture to think, be excluded.

For remarks on a supposed case of general xanthelasma without jaundice, and on so-called "Xanthelasmoidea," see note to Case 6 of Table II.

Nomenclature.—The name originally proposed by Addison and Gull was certainly not a good one. Overlooking its hybrid formation and cumbrous length, vitiligo, the disease to which it referred, was and continues to be so vague and variously applied a term that it has deservedly been banished by the best pathologists; so that to say of a disease that it is like vitiligo is to explain what is obscure by what has become unmeaning. So great, however, is the practical inconvenience of altering a name once given, and so impossible is it for the complex collection of anatomical changes and vital functions and clinical symptoms which we call a disease to be adequately expressed by any single term, that it is doubtful whether a word which has been once accurately defined and is sufficiently distinctive without being misleading should ever be altered. Though ugly enough, "vitiligoidea" was a distinctive and a meaningless term, and could therefore neither confuse nor mislead; and it would be well if in such cases pathologists would follow the example of naturalists and allow no alteration from a term once given and sufficiently defined, even though it lead to such monstrosities as *Brachyteles* and *Smithornis*. Mr. Erasmus Wilson, however, proposed the name *xanthelasma* as a substitute for vitiligoidea. The term is correctly formed and not unpronounceable; it is perfectly distinctive, and expresses only the undoubted fact which Rayer denoted by the term *plaque*

jaunâtre. It is, in fact, a translation of “*plaque jaunâtre*” or of Mr. Wilson’s original term *papillæ et laminæ flavæ epithelii cutis*.

Dr. Frank Smith, in the ‘*Journal of Cutaneous Medicine*’ for October, 1869, used a new term, *xanthoma*, which means, of course, a yellow tumour, and is formed on the model of the anatomical classification of new growths carried out by the illustrious Virchow. This form of the word has been adopted in the chapter on the disease by Kaposi (better known to dermatologists as Moritz Kohn), which forms part of Hebra’s great work upon diseases of the skin.¹

No doubt xanthoma is a more appropriate term for the nodules of vitiligoidea tuberosa, just as xanthelasma applies better to the flat plates of *v. plana*, and if the two words are to run together they might be so appropriated. Fortunately they are so similar as to make it almost a matter of indifference which is used, but on the simple ground of priority it is, I think, better to keep to xanthelasma.

Professor Virchow, in the article in the 52nd volume of his ‘*Archiv*,’ already referred to, calls Von Gracfe’s case *xanthelasma multiplex*. He there criticises the name xanthelasma, and proposes in its stead that of *molluscum lipomatodes*, believing that a complete series of fibroid new formations can be traced from elephantiasis (Arabum) or pachydermia to molluscum fibrosum, which he would again closely associate with xanthelasma. With the utmost deference for the authority of the greatest of living pathologists, and because that authority is so high, I will state why I venture to differ from him on this point. In the first place, xanthelasma does not, as Prof. Virchow objects, carry with it the assertion of a “yellow formation” of altered rete mucosum, nor is it “eine etymologisch nicht zu billigende Nachbildung von Melasma.” It is a good enough compound of ξανθός and μέλασμα. Even if Von Gracfe’s case were accepted as one of genuine xanthelasma, and if the view of the pathology taken by Professor Virchow were generally adopted, the word xanthelasma or xanthoma is too well established to be eradicated without much trouble, and

¹ Since writing this I see that Dr. Bristowe has also adopted it in his ‘*Theory and Practice of Medicine*.’ See also a letter by Mr. Erasmus Wilson to the ‘*Brit. Med. Journ.*,’ February 10th, 1877.

might very well stand as a peculiar form of fibroma. But the proposed change may be deprecated upon broader grounds. Professor Virchow writes:—"The terminology of medicine can only gain the accuracy which it needs by our habitually rejecting those collective designations which have been imposed from mere resemblance of external form and consistence." If for "medical terminology" we substitute "the terminology of morbid anatomy" the observation is unquestionably true. The basis of the nomenclature of morbid structures must be histological, and if names can be devised like glioma, myoma, and many others with which Professor Virchow has enriched pathology, names which carry with them the anatomy of the tumour designated, such a nomenclature deservedly replaces the old terms which were derived from accidental resemblances to potatoes and cauliflowers and sponges. But such names are only possible when the structures in question are thoroughly understood, and when this structure can be referred to some normal tissue, of which the name at once suggests all the characters. So that even in morbid anatomy we cannot yet give up describing certain tumours as "carcinoma," though the word has entirely lost its original meaning.

When, however, we name a disease, we are not naming an anatomical structure or even a physiological process; we are putting an unmistakable and convenient ticket upon a group of symptoms which we clinically observe in frequent combination, and which we can connect with some pathological process or structural change. The object of medical nomenclature is not scientific but practical. To say that a man was suffering from granulation growths of the skin would not give one half the information which is connoted by the word "leprosy." And in the same way, whatever may be its true morbid anatomy, xanthelasma is a disease which in its distribution, its etiology, its concomitants, and its prognosis, has no relation to cases of molluscum fibrosum or of elephantiasis.

As a point of accuracy in nomenclature it is desirable to avoid using the word "tubercle" in its merely descriptive etymological sense. Whether we call the perivascular growths of tubercular meningitis, or the caseous material of "scrofulous" pneumonia, or the clustered intra-alveolar deposits of ordinary phthisis, tubercle, confusion is only increased by using the

same word for the "tubercles" of leprosy. The small tubera of xanthoma may be better called nodules.

External form.—The affection occurs in the two principal forms recognised by Addison and Gull, as maculæ (*x. planum*) and as nodules (*x. tuberosum*). The distinction is a real one, although it would be possible to recognise minor varieties, as *x. lineare* when the maculæ affect the palms of the hand and the flexures of the joints; and *x. papulatum*, since the nodules begin as smaller solid elevations which afterwards become confluent, and thus each nodule is made up of numerous lesser ones. The yellow colour is so striking and the locality of the common macular form (*x. palpebrarum*) so constant, that the appearance of the affection is very characteristic. Rayer compared the patches to chamois skin. They are very slightly raised, firm, and evidently seated in the substance of the skin. To any one who has not seen a case, I would recommend the coloured lithographs in Addison and Gull's paper of the maculæ on the face and the nodules on the elbow and ears, and those of the hand, elbow, eyelids, and gums, in Dr. Fagge's paper in the 19th vol. of the 'Pathological Transactions.'

Local distribution.—Xanthelasma occurs by far most frequently in the skin of the eyelids, beginning at the inner canthus and usually on the left side. Next it affects the skin of the palms and soles, appearing as white lines in the natural creases and as nodules on the knuckles and the fingers. It also affects the ears and the flexures of the joints, including the front of the neck, and the yellow maculæ may spread from the eyelids to the nose and cheeks. In advanced cases the nodules and patches have been observed on the back and abdomen as well as on the face and limbs. Xanthelasma in its macular form has been frequently observed in the mucous membrane of the mouth, the lips, tongue, and palate, also in the trachea and in the mucous membrane of the bile-ducts. It may probably also affect the peritoneum (especially that covering the spleen) and the inner coat of arteries; but in these positions it is impossible to distinguish it anatomically from similar pathological changes which are due to other causes, or at least occur in association with very different symptoms, so that we must interpret yellow patches in these situations by

the condition of the skin and by the general history and course of the disease.

Bathymetric distribution.—The process affects the deep layer of the cutis essentially, but may thence spread to the subcutaneous tissue and secondarily affect the papillæ and the epidermis.

Histology.—The first microscopical investigation of this affection was made in Dr. Pavy's case (Table I, No. 4). The patient's consent having been obtained, a large nodule was removed from the back of the little finger. On its under surface the appearance of separate smaller nodules was more conspicuous than externally. They extended up to and involved the cutis, but not the epidermis. When torn to pieces, a nodule was found to consist of very dense and tough fibrous tissue, and a drop of water in which it lay became opalescent from the juice which exuded and full of oily granules. In the flat maculæ the cutis was pervaded with a similar cream-coloured deposit of minute oil-drops. Dr. Moxon's drawing of a vertical section of the nodule, which accompanies this description, shows that the papillæ were intact and normal in size, but, like the cutis beneath them, infiltrated with oil-drops and granules, and also contained acicular crystals, which are not further described. This examination completely refuted Hebra's hypothesis that the disease was one of the sebaceous glands,¹ an assumption which led other writers to call it *Stearrhæa flavescens*.

The next careful histological examination was by Dr. Frank Smith, in the 'Journal of Cutaneous Medicine' for 1869.² A thin section made with a Valentin's knife from one of the nodules on the back of the hand showed the following appearances. The horny cuticle was "hypertrophied to nearly twice the thickness of that covering the adjacent skin; the rete

¹ See pp. 127-129 of vol. i of the Sydenham Society's translation. This chapter was written by Professor Hebra for the English edition. In the original text, 1860, there is no mention of vitiligoidea in the chapter on affections of the sebaceous glands, which was written by Professor Zeissl. The chapter on "Xanthoma" by Dr. Kaposi only appeared in the second edition of the German work, but has been translated by Mr. Waren Tay in the third volume of the Sydenham Society's translation, with additional cases.

² Since writing the above, the early death of this accomplished physician is announced. See the 'British Medical Journal' of February 3rd, 1877.

mucosum was hypertrophied to about the same extent and was stained with a yellow colouring matter soluble in ether. The corium, also hypertrophied, made up the rest of the tumour. The corium was densely corpusculated; the corpuscles of irregular size and shape, non-nucleated, apparently consisting of connective-tissue-germs, but on soaking the tissue in ether about half of them disappeared, still leaving a great number of irregularly shaped granules in the meshes of the areolar fibres. In the centre of the tumour a sweat-gland was evident, but, owing either to infarction or to an accident in the section, the outlet was not visible." With the exception of the thickened epidermis, which has accidentally fallen off in Dr. Moxon's specimen, this account agrees with his in the essential features of thickening of the corium with hyperplasia of its corpuscles, granular and oily infiltration, and negatively in the immunity of the sebaceous glands, the hair-sacs, and the sweat-glands.

Two years later appeared in the 52nd volume of 'Virchow's Archiv' two histological examinations of xanthelasma by Professor Waldeyer and by Dr. Leber. Dr. Waldeyer (page 319) prefaces his account with a careful description of the normal structure of the skin of the eyelids. He describes the cutis as containing few cells, and consisting of large and firm bundles of connective tissue, united by scanty and delicate threads, so as to form a loose and open network, whose large areolæ or lymphatic spaces readily swell up from inflammation or from dropsy. Although connective-tissue-corpuscles are generally scanty, they are found as tolerably large fusiform and stellate cells collected around the hair-sacs and sebaceous glands, about the glomeruli of the sweat-glands, and in the fibrous sheaths of the vessels and nerves. Stellate pigment-cells filled with light brown or golden yellow granules are found lying separately here and there in the upper layers of the cutis. In his case of *xanthelasma planum palpebrarum* Waldeyer found these stellate pigment-cells somewhat increased in number, but the yellow colour of the maculæ chiefly depended on a fatty degeneration of a multitude of newly formed cells, that is to say, it consists in a hyperplasia of the corpuscles which are grouped around the glandular apparatus, the vessels, and the nerves of the cutis, and in a rapid molecular fatty degeneration

of these cells. Waldeyer moreover distinctly contradicts Hebra's hypothesis that the disease is essentially one of the sebaceous glands. It is, as he well puts it, an interstitial and not a parenchymatous dermatitis. He continues, "Xanthelasma resembles other pathological processes in the skin accompanied by a new formation of cells. Every dermatitis and new growth, glanders, syphilis, &c., begins and spreads with the cell-proliferation which is their anatomical expression, in those parts which are, so to speak, prepared for the morbid process by the greater abundance of corpuscles." At the same time he points out, and figure No. 5 of the accompanying plate confirms the observation, that xanthelasma has some peculiarities of its own. In the first place, the fatty deposit in the new cells is not so finely granular as in ordinary degeneration. It readily runs into large drops, though it never changes the cell which it occupies into one of the large spherical vesicles of normal adipose tissue. Secondly, this fatty degeneration does not appear to have a destructive influence upon the cells themselves, for after the oily matter had been extracted (with ether) there remained behind a considerable quantity of protoplasm with a nucleus, so that the cell still remained larger than a normal connective-tissue-corpuscle of the eyelids. In accordance with this observation, Waldeyer did not see in his case any granular or milky detritus, or confluent cells, or masses of cholesterine or of earthy salts.

Dr. Leber's observations were made on Von Graefe's case, which we have already given reasons for regarding as doubtful. The new growth in the eye consisted of connective tissue with spindle-cells, most of them containing fat, some multinuclear, and the whole is naturally regarded as of a completely sarcomatous character. In the nodules of the skin the epidermis was thickened and its deeper layers deeply pigmented, but the nodules consisted chiefly of a hyperplasia of the cutis, forming dense connective tissue rich in cells, which were more or less infiltrated with fat. The papillæ were only slightly enlarged. In the smaller nodules there was no fatty deposition, but some of the cells contained yellow or yellowish-brown pigment-granules. In commenting on this account, Professor Virchow only adds that he found the central part of the nodules so thickly filled with oil-drops that it was quite opaque, while the

external and younger parts of the growth were almost entirely formed of proliferating connective-tissue-elements, and here and there the number and size of these elements reminded the observer of a sarcoma. "The appearance," adds Professor Virchow, "resembled the fatty metamorphoses of certain connective tissues, especially of the internal coat of arteries, but it could not be regarded as a true fatty metamorphosis, since the cells preserved their integrity even when filled with oil. The process must be therefore regarded rather as an infiltration and retention of oil similar to that which takes place normally in the cells of adipose tissue."

The next histological examination was published in the 'Pathological Transactions' for 1873, and was made by Mr. Howse (page 244). He found the new growth in the case of multiple xanthelasma which he examined to be essentially the same whether in a mucous membrane, on the tendons, or in the skin. "It appears to be a kind of universal atheromatous change. From wherever taken, the sections show fine granular cells, variously disposed amongst the fibrous tissue of the part affected. These cells are generally oval in shape, of very various size, ranging from the $\frac{1}{3000}$ to the $\frac{1}{500}$ inch in their long diameter. In the smaller a nucleus can often be detected, in the larger not. The latter are always the most granular; this may possibly account for the invisibility of the nucleus. I think, however, in most this structure has disappeared. I believe that these cells must have the same origin as the pyoid cells found in an inflamed part; that, in fact, vitiligoidea takes its origin in a kind of chronic inflammation, or (if we dislike that term) in a chronic process of cell growth. The oval form is evidently due to the lamellated form of the tissues in which they grow. Some of the cells elongate into an imperfect form of connective tissue; most of them, after attaining to the larger size, undergo fatty degeneration, which causes the intensely granular appearance of the larger cells. In the older growths they undergo still further degenerative changes, becoming converted into lumps of calcareous matter, crystalline bodies, &c. As in the case of the atheromatous patch, it is the central part of the growth which first undergoes this degeneration, probably from the same reason, viz. that it is the oldest. In the marginal parts

the granular cells reappear. It will thus be seen that the condition is exactly parallel to that found in the early stages of atheromatous degeneration of the arteries where a condyloma-like projection stands out from the internal coat."

In the following volume of the 'Pathological Transactions' (1874) Dr. Legg gives an independent account of the changes observed in sections of xanthelasmic patches on the scrotum and tongue. The cuticle was not thickened, and the glands did not share in the disease, nor the papillæ. "In the deeper layers of the subcutaneous connective tissue (of the corium?) were seen lengthened streaks of oil-globules." Examined with a higher power, the collections of fat-drops are found to contain cells of various size. "The smallest are not larger than red blood-corpuscles, round, oval, rhomboidal, and inclined to be spindle shaped. These smallest are free from granular contents and contain only one or two nuclei. Those larger are slightly granular, the largest of all are four or six times the size of the smallest. They are round or oval in shape, apparently contain no nucleus, and are filled by fat, not in many drops, but in one large drop distending the cell." In accordance with this, Dr. Legg concludes with Waldeyer that xanthelasma consists anatomically in "an overgrowth, in clusters, of the corpuscles of the connective tissue, followed by a fatty infiltration of the new cells," and adds that some of these were in his case so distended with oil that they might properly be called fat-cells. A yellow patch in the peritoneum of the same case appeared to depend on the presence of large ordinary fat-cells, supported by a network of arcolar tissue in the subserous connective. So that these yellow patches of serous membranes would seem to differ in their nature from true xanthelasma of the skin and mucous membranes.

In the case which I brought before the Pathological Society in 1873 an examination of the flat maculæ of the skin led to results which agree almost precisely with those indicated by Dr. Moxon's drawing. The epidermis was practically unaffected, and the papillæ also; but in the deeper layer of the cutis was an infiltration of small round cells with enormous numbers of oil-granules. I did not observe the large oil-filled fusiform cells described by Waldeyer, nor the spherical fat-cells seen by Dr. Legg.

Kaposi, in his chapter on xanthelasma in the second edition of Hebra's 'Hautkrankheiten,' completely confirms the account given by Pavy and Moxon. He says that he finds the epidermis and papillary layer of the cutis normal, but a rich deposit of yellowish-brown pigment in the deepest cells of the rete mucosum, and either free or in stellate cells in the subjacent corium. In the deep layer of the latter is found a new growth of connective tissue, in some parts rich in cells, in others more completely fibrous. The cells are not only the ordinary stellate connective-tissue-corpuscles, but also round cells with a highly refractive nucleus. The yellow colour depends upon collections of oil-granules; but Kaposi agrees with Waldeyer and Virchow in regarding its presence, not as significant of fatty degeneration of the textural elements, but as a true deposit (Einlagerung) of oil, which leaves the tissue it affects unchanged in structure and capable of the active functions of life. He therefore defines the affection anatomically as an interstitial new formation of connective tissue with deposit of yellow oil in the elements of the cutis.

Dr. Fagge ('Catalogue of Models in Guy's Museum,' p. 171) says that "in all but the most superficial parts of the cutis, and even in the subcutaneous tissue," are "aggregations of little bodies of irregular form, some oval, some triangular, some rod-shaped . . . several of them arranged side by side in the form of a fan, so as to resemble radiating crystals."

On reviewing these eight independent observations¹ it appears to me perfectly clear that xanthelasma consists anatomically in a chronic hyperplasia of the deeper layer of the cutis, in which the papillæ and epidermis on the one hand and the subcutaneous connective on the other are only secondarily involved. The process may run in two directions. When it follows what may be called the inflammatory type, the minute, round, inflammation-cells or young leucocytes never form true tissue elements; molecular fatty degeneration rapidly overtakes them, and leads to their ultimate disappearance in a detritus of oil-drops, calcareous masses, and cholesterine crystals. This is the process which I observed myself in its early stage, which Dr. Moxon described at a somewhat later period, and which Mr. Howse found in its

¹ By Pavy and Moxon, Frank Smith, Waldeyer, Howse, Legg, Kaposi, Fagge, and myself.

most advanced condition. The other course the disease may take approaches the process of formation of a true tumour or new growth. Here, also, we must recognise some local "irritation" as the immediate cause of cell-proliferation, but the new cells produced are in these cases more robust and long lived. Instead of quickly dying by fatty degeneration they grow to a considerable size and develop processes, so as to form the fusiform and stellate corpuscles of connective tissue. The intercellular matrix also develops into well-formed fibres. These cells are also liable to fatty degeneration, but the process is much more slow, less destructive, and more akin to the normal transformation of ordinary connective into adipose tissue. This is the process described in its earlier stage by Dr. Frank Smith and in its later by Waldeyer and again by Dr. Legg. That a certain amount of true fatty degeneration accompanies the process is clear from Waldeyer's account, and it seems probable that the ultimate fate of the cells observed may be the same as that which more speedily befalls the smaller corpuscles of the other form of the disease. That the two directions the morbid change may take are far from mutually exclusive is shown by the histological characters as well as by the clinical features of the disease. In the internal organs the condition is all but simple fatty degeneration; in the maculæ of the skin there is more persistent cell-proliferation, and in nodules of *x. tuberosum* the formative process greatly outstrips the degenerative. At one end xanthelasma is, as Mr. Howse suggested, strictly analogous to chronic inflammation of the deeper part of the intima of arteries, the atheroma of authors; at the other it resembles those forms of sarcoma or connective-tissue growths which show a tendency to fatty infiltration, and here xanthoma would approach in its anatomical characters to the *fibroma lipomatodes* which Virchow describes.

The occurrence of true adipose tissue with large spherical fat-cells has only been observed by Dr. Legg, and if his specimen was taken from the skin of the scrotum it is certainly very remarkable; if from other parts or from the tongue one may venture to suggest that it would be extremely difficult to determine between the formation of new adipose tissue in the cutis vera and the penetration of the disease from

the deeper part of the skin into the closely adjacent subcutaneous adipose tissue.

If Von Graefe's case be accepted as genuine it would show that xanthelasma may, as the extreme term of its tumour-forming process, appear as a true sarcoma of an invading and recurrent, *i. e.* of a semi-malignant character.

However, we have in this apparently insignificant affection of the skin a pathological process exhibited which may throw light on the all-important relation between inflammation, degeneration, tissue growth, and formation of tumours.

Diagnosis.—The colour and localisation of the common *X. palpebrarum* are so remarkable that the disease can scarcely be overlooked. The nodules are, no doubt, less distinctive, but they probably never occur without the maculæ, and their colour is sufficiently peculiar. The somewhat severe method of diagnosis recommended in Hebra's 'Handbook' is scarcely necessary to distinguish true xanthelasmic patches from milium or sebaceous cysts. That Mr. Hutchinson put them all together was no error of observation or of diagnosis. At that time he naturally accepted on Hebra's authority the erroneous belief that the disease described by Rayer and by Addison and Gull has its seat in the sebaceous glands. And Mr. Hutchinson's object of investigation was not xanthelasma, as an anatomical process affecting various regions of the body, but the possible causes which produce chronic pigmentary or other changes in the skin of the eyelids, whether yellow patches, or sebaceous cysts, or mere temporary accumulation of pigment.

Frequency.—In the simpler form of flat yellow patches about the eyelids (*X. planum*) xanthelasma is not uncommon. If we look for it we may see it every now and then in persons past middle life among our hospital patients and in society. When it extends to other parts of the skin and to mucous or serous membranes (*X. multiplex*), and especially when it assumes the tuberous or nodular form (*X. tuberosum* or *Xanthoma*) it is certainly a rare disease. I have searched the hospital records for the last ten years, and have included all the cases of xanthelasma in Table I. Of course several cases of chronic jaundice with enlarged liver in women between forty and sixty appeared in the wards from 1866 to 1876, but in the majority

of them there was no xanthelasma. In fact, I believe that this paper includes all the cases yet recorded of multiple and of nodular xanthelasma, and a reference to the table will show that only three cases of well-marked nodules have yet been observed, excluding those which I have marked as doubtful or spurious. These are Nos. 2, 4, and 8. In each the patient was a woman, and in each she had been long jaundiced before the affection of the skin appeared. There was also maculæ of the eyelids and other parts.

Sex.—Two out of every three of Mr. Hutchinson's patients were women.¹ Five of the six cases in a single family reported by Dr. Church occurred in women. The remaining cases of genuine xanthelasma make twenty-five more, of which fifteen occurred in women and ten in men; so that the proportion on the whole is thirty-five to twenty, or rather more than three to two.

Age.—All Mr. Hutchinson's patients were above 30, and only three under 40. Of thirty-one other patients whose ages are given, including Dr. Church's, one was between 20 and 30, nine between 30 and 40, eleven between 40 and 50, four between 50 and 60, and six above 60. Xanthelasma palpebrarum is certainly an affection of the later period of life, and in this point as well as in its histology it closely resembles the chronic inflammation which produces atheroma of the arteries. Subsequent experience has confirmed Mr. Hutchinson's statement that the affection does not occur under puberty. But it will be noticed that chronic jaundice can produce the same change in the skin of persons comparatively young, for all the patients under thirty with exception of the doubtful case mentioned by Kaposi (No. 5 in Table II) had suffered from jaundice.

We may thus compare the effect of jaundice to that of hard work and of drink in prematurely bringing on senile changes, and especially fibroid and fatty degeneration, which sometimes assume the character of chronic inflammation and sometimes

¹ Without pretending to distinguish accurately which of these cases would, according to our present knowledge, come under the description of xanthelasma, I have found that by going through Mr. Hutchinson's table and excluding all which are doubtful, we should have remaining about fifteen cases in women to nine in men.

that of more passive metamorphosis. It is also observable that the patients who suffered from multiple xanthelasma, and especially from xanthelasma tuberosum, were younger than those who showed simple maculæ of the eyelids.

Hereditary transmission.—Dr. Church's six cases of *X. planum palpebrarum* already referred to are remarkable from the fact that they occurred in three members of one generation of a family, and in three in the next generation of the same family. Of these six, five were females, out of twelve in all who reached the age of 40, while the single male patient was one of five who attained the same age ('St. Barth. Hosp. Reports,' vol. x). A mother and daughter, also, seen by Dr. Wilks, were both affected by the same macular xanthelasma of the eyelids ('Path. Trans.,' vol. xix, p. 446).

Subjective symptoms.—These only occur in the graver forms of the affection, when it is multiple. Thus, Dr. Frank Smith's patient could not kneel or hold a scrubbing brush with comfort. In Cases 4 and 18 pain and tenderness were complained of, preventing the one patient from sitting, and the other from handling his tools. Xanthelasma palpebrarum is without any symptoms and is rather a deformity than a disease.

Course.—The simple *plaques jaunâtres* or *maculæ* appear first, and almost always in the eyelids, beginning at the inner canthus of the upper lid, usually the left first, and thence spreading to the corresponding part on the other side, then to the lower lids. At last the maculæ encircle both eyes, sometimes by gradual extension, sometimes by a new start, beginning in the outer canthus. In the majority of cases (24 out of 37, beside the whole number observed by Mr. Hutchinson) the affection stops here. When it becomes multiple the maculæ may spread over the cheeks and nose; but more often they appear in the creases of the palms of the hands, then in those of the neck, elbow, and sole of the foot, and as pale yellow patches in the mucous membrane of the mouth. The nodules of *X. tuberosum* only appear in the later stages of the disease, and affect the extensor surface, the knuckles and elbows and knees, by preference. The progress of the affection is slow, and from the first fatty degeneration is apparent. In two of the longest and best observed cases by Dr. Fagge (No. 4) and by Dr. Frank Smith (No. 8), involution has been observed in some

parts while in others the affection increased. "Some of the creamy patches had disappeared. The nodules on her hands and elbows were also less tender than formerly, so that she could use her hands" ('Path. Trans.' vol xix, p. 438). Again, several weeks later, "The nodules on the hands and feet are smaller, softer, and less painful than before" (p. 439). And in the account of the post-mortem examination, though "the xanthelasmic patches round the eyes were very plainly marked, those on the backs of the hands were much less distinct than formerly, as, indeed, was the affection of the skin generally; on the abdomen very little of it was to be seen" (ibid., vol. xxiv, p. 242). So Dr. Frank Smith reports that before death "the raised white lines on the palms of the hands had entirely disappeared; the size of the nodules on the hands, knees and feet was decreased to a remarkable extent; and, in her own words, got less every day." At the autopsy "the palpebral plaques were as evident as ever; nodules on the hands and feet very much fewer than when the cast was taken" (ibid., vol. xxviii).

Concomitants.—The most remarkable of these is jaundice. It occurred in eighteen out of the thirty-eight cases I have collected, not counting one in which it appeared after xanthelasma, and another in which the patient had been jaundiced twenty years before. Of Mr. Hutchinson's thirty-six patients six had been jaundiced.

But the connection is more striking if we exclude the simple and common form of xanthelasma, *X. planum palpebrarum*. We then find that in every case but two, in which the skin affection had spread beyond the eyelids, there was jaundice. Both the exceptional cases are recorded by Hebra and Kaposi; in both the maculæ appeared on the neck or the neck and cheeks, and in one jaundice supervened.

All the multiple cases, including all the nodular ones and all those in which post-mortem examinations have been made, occurred in patients who were jaundiced at the time. The jaundice was always long-continued, often recurrent, and probably always due to some organic cause. The result of the first autopsy, made by Dr. Murchison, led that eminent physician to believe that the jaundice accompanied with xanthelasma was due to some peculiar affection of the liver. Subsequent experience has, we have seen, not borne out this supposi-

tion. The eight cases which proved fatal have been ascertained to be, two of cirrhosis with hypertrophy (4 and 7 in Table I), one of simple and one of cancerous stricture of the common duct (10 and 16), one of obstruction from hydatids (14), two of occlusion by gall-stones (11 and 13), and one of "chronic atrophy of the liver" (8). In two other cases (12 and 15) gall-stones were passed during life, and in three others (5, 6, and 8) the symptoms were pretty certainly referable to ordinary cirrhosis. All that seems necessary for the production of multiple xanthelasma seems to be that the jaundice should last long enough. The shortest time in which it has appeared was in my patient who died from cancer of the liver after being jaundiced for rather less than six months; the yellow patches appeared in his eyelids between six and eight weeks before his death.

One naturally cannot help connecting xanthelasma in these cases with the presence of bile pigment in the skin, and with the pruritus which jaundice often occasions. This symptom was noticed in the case just mentioned and in several others.

Mr. Hutchinson has called attention to the fact that xanthelasma palpebrarum often appears in persons who have been frequently liable to sick headaches.

Six out of his thirty-six cases occurred in persons who had been the subjects of jaundice, nineteen in those who had suffered from sick headaches. Considering the frequency of sick headaches and so-called bilious attacks, and the weak memories and careless readiness of out-patients, I confess I doubt whether the connection is more than accidental. Moreover, we have numerous cases of xanthelasma in persons who have never suffered from sick headache, and we must all know persons who suffer for years from sick headaches and never acquire xanthelasma. It is worth noticing, also, that of Mr. Hutchinson's thirty-six patients, nineteen were between forty and sixty, and fourteen over sixty years of age; so that in the large majority of cases the affection of the eyelids must have come on many years after early adult life. But the simple "idiopathic" jaundice, which is readily recovered from, is very much confined to persons between the ages of twenty and forty; and dyspepsia, bilious attacks, and sick headaches, are also, as a rule, the plagues of young adults, and usually pass away or become less severe after

fifty or sixty. Hence, it is almost certain that most old men and women with xanthelasma, milium, or sebaceous cysts of their eyelids, must have suffered from jaundice or sick headaches, if at all, many years before the cutaneous deformity appeared.

Diabetes only occurred in one doubtful case (Table II, No. 2), and the occurrence of ague and of erysipelas in two or three others must, no doubt, be regarded as accidental.

I. TABLE of cases of *Xanthelasma* referred to in this paper.

No.	Sex.	Age.	Variety.	Locality.	Concomitants and state of the liver.	Physician.	Reference.
1	Mrs. B.	42	Planum	Eyelids and palms	Jaundice 14 months. Pain	Addison and Gull	G. H. R., 1851, p. 267. <i>Models in Guy's Museum</i> , 372-3.
2	Eliza P.	33	Planum et tuberosum	Palms, eyelids, elbow, ear, knee, dorsum of fingers, and toes	Jaundice 14 months. Liver enlarged and tender	Ditto	Ibid., p. 269, <i>Pl. II.</i> and 1852, p. 150, <i>Pl. III. Models</i> 374-5, and 7 years later 376-7.
3	Mrs. J.	43.	Planum	Eyelids	Jaundice about 2 years	Ditto	Ibid., p. 271, <i>Pl. I.</i>
4	Louisa L.	39	Planum et tuberosum	Dorsum of fingers, eyelids, face, neck, ears, palms, heels, &c., mucous membrane of mouth	Soon after second attack of jaundice. Cirrhosis. (Autopsy)	Pavy and Fagge	Ibid., 1866, p. 277, <i>Plate. Models</i> 378—380.
5	R. C.	45	Planum	Eyelids	Second attack of jaundice. Cirrhosis?	G. H. Barlow	Also <i>Path. Tr.</i> , 1868, p. 436, <i>Plates</i> , and <i>ibid.</i> , 1873, p. 242. Fagge, <i>Path. Tr.</i> , 1868, p. 441.
6	John B.	33	"	Eyelids, palate, gums	Jaundice about 18 months. Syphilis. Cirrhosis?	Habershon and Wilks	Ibid., 1868, p. 434. See <i>quel in this paper.</i>
7	Angelo S.	41	"	Eyelids	Jaundice 12 months. Cirrhosis. (Autopsy)	Murchison	Ibid., 1869, p. 187.
8	Charlotte S.	28	Planum et tuberosum	Eyelids, hands, feet, elbows, knees, chest, gums	Jaundice 5 years. Erysipelas. "Red atrophy." (Autopsy)	Frank Smith	J. of Cutaneous Med., Oct. 1869; <i>Path. Tr.</i> , 1877.
9	Ann S.	48	Planum	Eyelids	Jaundice 2 years. Ague. Liver enlarged	Rees and Pye Smith	This paper.
10	George Q.	32	"	Palms, knuckles, scrotum, back, eyelids	Jaundice 8 months. Simple stricture of duct. (Autopsy)	Moxon	<i>Path. Tr.</i> , 1873, p. 129. <i>Models</i> 381—383.
11	Maria B.	49	"	Eyelids, palms, bile-ducts, spleen	Jaundice, third attack. Ague. Erysipelas. Calculus. (Autopsy)	Pye Smith	<i>Path. Tr.</i> , 1873, p. 250. <i>Drawing in Guy's Mus.</i>

No.	Sex.	Age.	Variety.	Locality.	Concomitants and state of the liver.	Physician.	Reference.
12	Susan G.	32	Planum	Lower eyelid	Jaundice repeatedly. Calculi passed	Rees and Habershon	This paper.
13	Sarah B.	46	"	Left eyelids	Repeated jaundice from calculi. Impacted gall-stone. (Autopsy)	Habershon	Ibid.
14	M.	35	"	Eyelids, ear, scrotum, elbows, palm, neck, &c., tongue	Jaundice 9 months. Hydatid. (Autopsy)	Black	Wickham Legg, Path. Tr., 1874, p. 155.
15	F.	36	"	Palms, soles, elbows, eyebrows, ears	Jaundice 2 years. Calculus	Andrew	Ibid., p. 259.
16	Robert S.	58	"	Eyelids	Jaundice 4 months. Erysipelas. Cancerous stricture. (Autopsy)	Pye Smith	This paper.
17	F.	41	"	Eyelids, face and neck, flexures of elbows, fingers and toes, mucosa of mouth	Jaundice over 2 years. Obstruction, calculus?	Foot	Dublin Journ. of Med. Science, May, 1876. <i>Plate.</i>
18	William C.	32	" (lines and papules)	Flexures of fingers and of elbows, abdomen	Jaundice 3 years. Pruritus. Cirrhosis?	Fagge	This paper.
19	F.	65	Planum	Eyelids	No jaundice. Sick headaches when young	Pye Smith	Ibid.
20	M.	50	"	Eyelids	No jaundice. Sick headaches?	Ditto	Ibid.
21	M.	65	"	Eyelids	No jaundice or sick headaches	Ditto	Ibid.
22	F.	40	"	Neck and cheeks	Jaundice afterwards. Cause unknown	Hebra & Kaposi	Hautkr., ii, p. 256 n.
23	M.	35	"	Neck	No jaundice. Psoriasis	Ditto	Ibid.
24	M.	40	"	Eyelid	No jaundice	Ditto	Ibid.
25	F.	40	"	Eyelids	Jaundice 20 years before	Ditto	Ibid.
26—28	Three cases of x. planum of the eyelids, with no mention of jaundice				{	Bärensprung	} Ibid.
29—31	"	"	"	" one with jaundice, two without		Hirschberg, Geissler, Manz	
32—37	Six	"	"	" without jaundice in one male and three female members of the same family		Church	
38	One	"	"	" with no mention of jaundice	Waldayer.	Hutchinson	
	Numerous cases of x. palpebrarum, about a fourth affected with jaundice						

II. TABLE of *spurious or doubtful cases*.

1	F.	24	Papulatum	Nose and cheeks	No jaundice	Addison & Gull	G. H. R., 1871, p. 267.
2	M.	27	Tuberosum	Limbs, trunk, and face	Ditto, diabetes	Hughes	Ibid., p. 268.
3	M.	18	Papulatum	Hand and wrist	Jaundice	G. H. Barlow	Guy's Mus. Catalogue, No. 384, p. 178
4	M.	35	" et tuberosum	Eye, limbs, trunk	No jaundice mentioned	v. Gräfe, Virchow and Hirschberg	Virchow's Archiv, vol. li, p. 504.
5	M.	24	Papulatum	Root of penis	No jaundice	Hebra & Kaposi	Hebra's Hautkrank., Bd. ii, s. 256, No. 5.
6 ¹	M.	7	Planum	Trunk and limbs	No jaundice	Tilbury Fox	Clin. Soc. Tr., vol. viii.

See note overleaf.

Note.—The last case in Table II is one which was brought before the Clinical Society in the session 1874-5. It was published in the 'Transactions' of the Society, and figured in part 16 of Dr. Tilbury Fox's 'Atlas.'

He remarks that the term "acute' general xanthelasma" would roughly describe the case, and it is referred to under this title in Dr. Roberts's treatise on medicine in proof of the assertion that multiple xanthelasma may occur without jaundice, but the title given to the paper is "Xanthelasmoidea (an undescribed eruption)." A case shown by Mr. Morratt Baker, and figured in the same volume of the Clinical Society's 'Transactions,' was called by him simply "A rare form of Skin Disease." It occurred in a child twelve months old, as red and yellow patches covering the back, buttocks, and thighs, and also affecting the face, the scalp, and the arms. There was least of the eruption on the legs, and none on the palms and soles. In the course of a debate at the Pathological Society, Dr. Thomas Barlow stated that Mr. Baker's case looked exactly like Dr. Fox's. The latter also occurred in a male child, seven months old, and had existed from very soon after birth. The trunk, head, and limbs were all affected with dullish red spots, or dusky copper-coloured, elevated and firm, like chamois leather. Dr. Barlow himself very kindly sent me a case of his own, which, he says, is almost identical with those of Mr. Baker and Dr. Fox in general features, and "notably in its proneness to itching." The patient is a girl two years old, and has had the complaint since a few months after birth. The eruption, like that in the other children, consists of mottled, reddish-yellow, somewhat measly-looking, flat patches, slightly raised, and partly confluent. The colour in some parts is rose, in others of a dingy hue, not unlike that of *tinea versicolor*. Whatever this curious affection may be, for it seems pretty clear that the three cases are closely related, it is certainly not xanthelasma, with which it appears to me to have no point of affinity. At present Mr. Morratt Baker's description of it as a rare form of skin disease is probably best. With regard to the proposed name "Xanthelasmoidea," I will venture to apply to it, *mutatis mutandis*, the judgment Dr. Tilbury Fox gives on "*Vitiligoidea*:"—"A villainous term; the disease is as unlike vitiligo as I am."

ON THE CAUSES OF PREVENTABLE BLINDNESS.

BY C. HIGGENS.

IN the last volume of the Reports I endeavoured to show how granular ophthalmia, purulent ophthalmia, and glaucoma can cause blindness which might be prevented. In the present paper I shall consider another affection which comes well within the meaning of the term "causes of preventable blindness," viz. sympathetic ophthalmia.

Sympathetic ophthalmia is almost entirely a preventable disease, but nevertheless one to which may be attributed very many of the cases of total loss of vision which come before us.

Definition.—We usually understand by "sympathetic ophthalmia" a series of peculiar inflammatory changes affecting the uveal tract (iris, ciliary body, and choroid) of one eye, coming on as a consequence of similar morbid changes which have been or still are in operation in the fellow eye. We shall, however, have to notice some affections which, although not of the nature of choroido-iritis, must nevertheless be looked upon as sympathetic.

Causes.—Sympathetic ophthalmia usually follows injury to one eye, and more especially wounds implicating the ciliary region, or associated with the lodgment of foreign bodies within

the globe. Wounds of the crystalline lens followed by opacity and swelling, and occasionally those of the cornea, which are followed by anterior synechia, may also give rise to it. Wounds of themselves are not sufficient to cause the disease; it is necessary first that the wounded eye become affected by a choroido-iritis. This choroido-iritis having been once set up may continue for a very considerable period, and eventually destroy the injured eye without its fellow becoming affected; but on the other hand, at any period during the progress of the disease, a similar set of changes may commence in the non-injured eye, which will almost assuredly lead to its destruction. And when the inflammatory process in the injured eye, having come to an end, has left it a softened painless stump, are we to consider that all danger to the fellow eye is passed? I think not; the stump is ever liable to fresh inflammatory outbreaks, accompanied by pain more or less severe, during which outbreaks the sound eye may become affected; hence, before going further, we may lay down the rule, *that a person with a blind eye which has been lost by choroido-iritis—especially if that choroido-iritis have resulted from an injury—is not safe from an attack of similar inflammation in the fellow eye so long as the lost eye remains in its orbit.* We need not, however, insist on excising every blind eye which we believe to have been lost from choroido-iritis; no change will occur in the sound eye without premonitory symptoms in that which is lost, so that we have only to warn our patient of what may occur, and recommend him to seek advice as soon as any change is noticed in the blind eye. Let us suppose that one eye has been injured, and that it is affected by choroido-iritis; some vision may perhaps remain, but very probably even perception of light is lost. Some irritation, watering, weakness, and perhaps intolerance of light in the fellow eye will be the immediate effects of the injury; such symptoms we have all experienced from slight injuries or lodgment of foreign bodies, &c.; these may soon pass off, the sound eye being apparently very little troubled. This state of things may go on for a very considerable period, there being, as previously stated, no rule as to the time at which sympathetic changes commence; the patient may resume his employment, and, excepting for the difficulty in measuring distance, and inability

to see on the side of the injured eye without turning the head, may be but little inconvenienced.

Presently, however, the injured eye, which may be still inflamed or have quieted down, becomes more irritable, is painful, and tender on pressure in the ciliary region; in fact, a fresh inflammatory attack has been lit up in it. At the same time we find that the sound eye is weak and irritable, intolerant of light, perhaps painful, vision becomes misty, and there is very profuse lachrymation, or complaints may be made of inability to continue near work or to read for more than a few minutes, showing that the power of accommodation is diminished. Muscæ may make their appearance, and should be looked upon with extreme suspicion, though their occurrence when both eyes are healthy need give rise to no apprehension. The muscæ are generally described as blacks, and appear large and dense to the patient, thus differing from the semitransparent threads, beads, and webs so often complained of in myopia.

The foregoing may be looked upon as the premonitory symptoms, some or all of which, with rare exceptions, mark the onset of sympathetic ophthalmia. We occasionally, however, meet with cases in which inflammation has commenced without warning, the patient's attention being first directed to the non-injured eye by rapidly increasing impairment of its sight. On examining the eye attacked by premonitory symptoms we shall at first find no change, but soon a blush appears in the ciliary region, the mobility of the pupil becomes impaired, iritis sets in, the cornea becomes hazy, and at times spotted ("keratitis punctata"), the aqueous and vitreous humours become turbid, and vision is greatly impaired; posterior synechiæ form, and spontaneous hæmorrhages may occur in the anterior chamber, the tension of the globe is increased, and in some cases, but by no means in all, very severe pain is complained of; soon the sclerotic is pervaded by a pinkish blush, whilst the injection of the ciliary region becomes more intense. The iris becomes vascular, swollen, and spongy, and pushed forward by pressure of aqueous humour collected behind it and confined by the now blocked and completely adherent pupil.

During this time similar changes to those going on in the iris are in operation in the ciliary body and choroid; the

ciliary processes become inflamed, swollen, and matted together by an extremely adhesive inflammatory material; the choroid becomes more vascular and infiltrated, and fluid is thrown out from its inner surface. The nutrition of the lens suffers, so that it becomes opaque.

These changes continuing in the iris and choroid, the vitreous becomes softened, undergoes absorption, shrinks, and drags away the inflamed and opaque retina from its attachment to the choroid. The inflammation is characterised throughout by the adhesive nature of its products, there being at no time any tendency to breaking down or suppuration. Later on the inflammation begins to subside, and atrophic changes set in; the globe becomes softened, the swelling of the iris subsides, but it remains thickened and bulged forward, the former position of the pupil being marked by a white tendinous plug. The choroid slowly atrophies, vision which has been gradually reduced to perception of light has now become entirely extinguished, and the globe eventually shrinks to a small irregular stump, more or less "squared" as it is called from pressure of the recti muscles upon its feebly-resisting tunics.

If we examine one of these "squared" irregular remains of the eyeball we shall find the sclerotic and cornea puckered, the latter, however, still retaining some of its transparency; the iris rotten and adherent to the remains of the opaque, shrunken, and often cretaceous lens; the pupil drawn together and plugged by a mass of inflammatory material, the vitreous represented by a small greyish nodule situated close to the back of the remains of the lens; the retina entirely displaced and folded together, so as to form a funnel, the base of which is attached to the atrophied and matted-together ciliary processes, the apex being fixed at the entrance of the optic nerve; the space between the detached retina and choroid is occupied by a yellowish or brown fluid; the choroid itself is atrophied, and if the eye have been long lost, bone will have become developed on its inner surface.

Such is the usual course of sympathetic ophthalmia; the inflammation, although extremely violent, is chronic in its course, several months elapsing between the first onset of the disease and its termination; its progress is often interrupted

by more violent outbreaks, and sometimes by remissions, during which hopes may be entertained that some vision may be saved, which hopes are, however, quickly dispelled by the occurrence of a fresh and perhaps more violent outbreak of inflammation.

The prognosis in cases of sympathetic ophthalmia must always be extremely unfavourable. We do, however, occasionally meet with cases in which the disease has stopped short of complete destruction of the globe, and still more rarely with some in which recovery takes place.

Thus we sometimes find that the inflammation, having continued long enough to cause complete closure of the pupil and opacity of the lens, begins to subside, and eventually leaves the globe of normal tension and curvature, and with good perception of light. In such a case, if we can manage to open a path for rays of light to pass to the retina, we may restore very useful vision. Here, however, we are met by a difficulty: nothing appears more simple than to make an artificial pupil by iridectomy; the operation is accordingly performed, and we find the iris so rigid and rotten that only the smallest piece can be torn away, or we may appear to have succeeded perfectly, a good black pupil being obtained; but here we are doomed to disappointment. Our patient having recovered from the operation, we naturally expect some improvement of vision; but no, there is still perception of light, no more. On the employment of lateral illumination we shall find that we have only removed the fibrous portion of the iris, our new pupil being still entirely blocked by the dark brown uvea, which adheres to the lens capsule as if fixed by the strongest cement.

The only course left open to us in such cases is the removal of a portion of the iris, not as in an ordinary iridectomy, but by the method recommended by Mr. Bowman, as follows:—Having passed the knife through the sclero-corneal margin into the anterior chamber, its point should be carried to the far side of the blocked pupil, then depressed and pushed through the iris, so as to make a transverse cut in it; next, the blades of a fine pair of scissors should be introduced at one extremity of the external wound; one blade being passed in front of, the other through and behind the iris, an incision should be made so as to meet the corresponding extremity of

the cut made in it by the knife-point; a third incision should then be made from the remaining angle of the external wound, and the piece of iris included between the three incisions, which will be of a spade shape, should then be lifted away with a pair of iris forceps, and its ciliary attachment divided with scissors. The lens, which has in all probability become softened, and will certainly have been wounded by the point of the knife thrust through the iris, should then be removed either by manipulation of the cornea aided by a curette in the incision, or with a scoop.

The following are the only two cases, of which I am aware, in which sympathetic ophthalmia has been recovered from :

George G—, æt. 25, came amongst my out-patients December 19th, 1873. He stated that eleven weeks previously an operation for removal of cataract had been performed on the left eye.

The pupil of the left eye was entirely blocked, there was severe iritis, a general pink colour of the sclerotic, with intense injection of the ciliary region; the eye had lost perception of light; the globe was shrinking and painful. There was rather severe iritis in the right eye, with marked ciliary injection. Instant excision of the left eye was recommended; he, however, objected to any operation.

He was ordered to take bichloride of mercury and bark, to keep both eyes bandaged with lint soaked in belladonna lotion, and to use atropine frequently to the right. He slowly improved. Three months later the left eye had quieted down, and nothing remained of the iritis in the right save a few posterior synechiæ, the eye was myopic, and there was a considerable crescentic patch of atrophied choroid immediately adjoining the outer margin of the optic disc; he had, however, always been short-sighted, and was no worse now than previously to the attack of inflammation.

The second case is recorded by Mr. H. Power in the 'Royal London Ophthalmic Hospital Reports,' vol. vii, part iv, p. 443.

The patient was a young man, æt. 19, who had received a perforating wound at the margin of the cornea of the left eye

followed by prolapse of the iris. All went on well for five weeks, when the right eye became affected by sympathetic ophthalmia. The disease continued with occasional relapses for more than seven weeks, when recovery commenced, and was complete in about a month.

We will now glance again at the causes of sympathetic ophthalmia which have been mentioned at the commencement of this paper. The ciliary region, probably on account of its rich nervous supply and great vascularity, is extremely intolerant of mechanical irritation. Wounds in this situation must always be looked upon with suspicion and carefully watched on account of their tendency to set up choroido-iritis, which, if allowed to run on, is extremely liable to make its appearance in the fellow eye. The immediate effects of a wound in the ciliary region vary with its nature and extent; a small puncture, for instance, may cause but little impairment of vision, and but little pain and irritation; considerable lacerations are always followed by hæmorrhage between the sclerotic and choroid, or into the vitreous chamber, which causes immediate and great impairment of sight. A puncture or small incised wound may heal well, leaving the function of the eye but little impaired. On the contrary, immediately after the receipt of the injury or at an interval of a few days the vision of the injured eye may begin to diminish; along with the impairment of vision marked inflammatory symptoms begin to be developed, which may eventually subside, but are more likely to increase, a well-marked choroido-iritis being quickly established. Such a case has lately been attending amongst my out-patients. The patient is a shoemaker. Some few weeks ago he wounded his right eye with an awl, inflicting a punctured wound near the inner margin of the cornea. When first seen the iris was prolapsed through the puncture, towards which the pupil was drawn; the eye was irritable and slightly painful; vision was, however, but little affected. In a few days the eye became intensely inflamed and painful; severe iritis having set in, vision was rapidly reduced to perception of light. I have recommended excision, but as yet the man has not made up his mind to undergo it.

These slight injuries are, perhaps, more to be feared than

extensive ones, not that they are more likely to set up choroido-iritis, but because we are tempted to try to save an eye which has received only a small wound, whereas we should not hesitate to excise one which has sustained a large incised wound or extensive laceration of its tunics.

Wounds made in operations may be the cause of sympathetic ophthalmia. In operating for cataract by what is known as "Graefe's modified linear extraction," in which the incision is made in the sclerotic immediately adjoining the corneal margin, should the incision be made a little too far back choroido-iritis may be set up followed by sympathetic ophthalmia. The operation of "sclerotomy," introduced some few years ago as a means of reducing tension in glaucoma, is, as far as my experience goes, an extremely fertile source of sympathetic ophthalmia. I employed it in a number of cases of glaucoma some three years ago, but gave it up on account of its tendency to cause choroido-iritis, which was in some cases followed by similar changes in the fellow eye. During the last six months I have been tempted to try it again. The result, however, has been the same.

I have now seen four cases in which sympathetic ophthalmia followed sclerotomy, one being that of Edgar G— reported in this paper. And I have excised some dozen or more sclerotomised eyes, which, having become affected by choroido-iritis, were perfectly blind, and which would very probably have caused sympathetic changes in the fellow eye.

Foreign substances that have penetrated the globe very frequently become imbedded in some part of the ciliary body, and will sooner or later set up choroido-iritis; should they, however, enter and lodge in some other situation their presence may be tolerated, and beyond the damage caused at the time of entrance they give rise to no further trouble. Thus we occasionally meet with small foreign bodies suspended in the vitreous which have been *in situ* for years giving rise to more or less impairment of vision, but having no tendency to set up inflammatory changes. An opaque and swollen or displaced lens may be looked upon as a foreign substance, and may set up choroido-iritis by irritating the ciliary body. An anterior synechia may do the same by dragging upon the ciliary attachment of the iris.

Injuries followed by suppurative inflammation do not cause sympathetic ophthalmia. We have only to fear those which set up a plastic inflammatory change.

Sympathetic ophthalmia although usually following choroido-iritis set up by injury would, however, appear occasionally to be a sequel of an idiopathic choroido-iritis.

In the case of a girl who was under my care four years ago at the Central London Ophthalmic Hospital, one eye became inflamed and was eventually lost by an adhesive choroido-iritis. I recommended excision, but her mother declined to have the eye removed. Some weeks later the other eye was attacked in a similar manner and with a like result. In this case, however, the disease may not have arisen from sympathy, but have been brought about by the same cause, whatever it was, which gave rise to it in the first eye. I would, nevertheless, recommend that an eye which has been lost by choroido-iritis, even though no injury has been inflicted, should be looked upon with suspicion, and excised if any threatening symptoms make their appearance.

As already stated sympathetic ophthalmia follows morbid changes which have become established in one eye. How are these changes transferred from one eye to the other? Upon this point we have no positive knowledge. It has been suggested by some that the disease travels along the optic nerves, by others that it is transferred by the ciliary nerves or by the sympathetic filaments; the whole subject is, however, involved in much obscurity, from which I will not attempt to extricate it.

Cases in which sight was destroyed by Sympathetic Ophthalmia.

CASE 1.—Martin W—, æt. 6 $\frac{1}{2}$, April 13th, 1876. Nine months ago left eye was injured by a piece of bone flying into it: he was treated at a hospital for some months. Three weeks ago the right eye became inflamed.

On admission.—There is extreme intolerance of light, so that the eyes can only be examined by forcibly separating the lids.

The left eye is painful and shrinking. In the right the iris is inflamed, swollen, and red from engorgement of its vessels;

the pupil is contracted and adherent to the lens capsule; the anterior chamber is extremely shallow, there is intense injection in the ciliary region, and a general pink appearance of the remaining sclerotic. T. n. (tension normal). Vision is nil.

Left eye excised; a seton placed in the right temple; the right eye to be kept bandaged with lint soaked in belladonna lotion.

R Hyd. cum Cretâ, gr. ij, ter die sumendum.

May 15th.—The eye in much the same condition; iridectomy attempted, but only a very small portion of the fibrous part of the iris could be got away, so rotten had it become.

July 24th.—Eyeball shrinking; all perception of light lost.

CASE 2.—*Sympathetic ophthalmia following sclerotomy.* Edgar G—, æt. 38, admitted June 12th, 1876. Three months ago had a severe blow on left lower eyelid with a door key, since which he has been unable to tell light from dark with the left eye; the lower lid was cut and swelled a good deal; under treatment the swelling subsided.

On admission.—Left pupil dilated, fixed, no reflection from fundus (probably blood in vitreous chamber), eyeball hard and painful (T + 2), right eye hypermetropia $\frac{1}{10}$ vision = $\frac{20}{30}$. Sclerotomy performed in injured eye. Tension was reduced; eye became quite quiet and painless.

October 17th.—Left eye has lately become inflamed and painful; sight of right has become dim, but there are no signs of inflammation. Left is affected by choroido-iritis, and is shrinking; recommended to have it excised, for which he was to come in on Thursday the 19th; to use atropine to the right eye.

30th.—For some reason or other patient did not return till to-day. The left eye is extremely painful and intensely inflamed.

The vision of the right eye is much impaired, the pupil is moderately dilated and fixed, there is a small ulcer in the centre of the cornea; the ciliary region is bright red, and the remainder of the sclerotic of a pink colour; the vitreous is hazy. Left eye excised.

Right eye to be bandaged with lint soaked in belladonna lotion; atropine to be used twelve times a day. Ung. Hydrarg. to be rubbed into right temple at night.

November 2nd.—Right eye can count fingers, is very painful; iris red and swollen, nearly in contact with cornea; pupil moderately dilated, bound down to lens capsule; ciliary region intensely injected; pink colour of sclerotic deepened. T. n. (tension normal); in fact, well-marked sympathetic choroido-iritis is established. To continue the belladonna lotion and atropine; to use equal parts of Ung. Hyd. and Ung. Opii, in lieu of the Ung. Hyd., and to take

℞ Ext. Opii gr. j omni nocte sumendum.

℞ Tinct. Ferri Perchlor. ℥xv,

Tinct. Nucis Vomicae ℥x,

Ex Aquæ ʒj, ter die sumendum.

December 28th.—Is still under treatment; eye retains perception of light and is of normal tension, but the inflammation has in no way abated.

CASE 3.—Arthur J. A—, æt. 9. A year ago the left eye was wounded with a fork; the sight was lost immediately. Soon after, the right eye began to fail, and vision was gradually reduced to perception of light.

On admission.—Left eye shrunken, painful, very tender on pressure, no perception of light. Right eye—whole of posterior surface of iris adherent to lens capsule (total posterior synechia); pupil occupied by a white plug of inflammatory material; iris discoloured, in contact with cornea; there was perception of shadows; eye somewhat irritable, tender on pressure, and intolerant of light. Left eye excised, and iridectomy performed in right. No improvement resulted.

CASE 4.—A man, æt. 40, was admitted into Guy's in July, 1874. Some months previously he had injured the right eye with a chip of wood; the sight was lost, and the eye became inflamed and painful. Soon after, the left eye became inflamed, and vision was soon reduced to perception of light.

On admission.—There was the scar of a wound in the ciliary region of the right eye. Both eyes were intensely inflamed, the irides being red and swollen, the pupils blocked

by inflammatory material, the anterior chambers obliterated, the ciliary regions bright red, and sclerotics generally injected; the eyeballs were very tender and painful, and there was much intolerance of light. Under the circumstances excision of the injured eye would have been useless. Both eyes were bandaged with lint soaked in belladonna lotion, and iron and quinine given internally. So soon as the inflammation had somewhat subsided iridectomy was performed in each eye, but no benefit resulted.

The last time I saw this patient both eyes had shrunk to small irregular stumps. He was quite blind.

Besides sympathetic ophthalmia we often meet with cases of what is known as "sympathetic irritation." Sympathetic irritation resembles the early stage of sympathetic ophthalmia, with which it is believed by some to be identical. The symptoms are great intolerance of light, profuse lachrymation, and sometimes pain, coming on in one eye after an injury to the other. Sympathetic irritation differs from the early stage of sympathetic ophthalmia in that the irritated eye may remain in much the same condition for an almost unlimited time; it also quickly regains its normal condition on removal of the cause.

The following cases will serve to illustrate these points:

Cases of Sympathetic Irritation.

CASE 1.—Agnes S—, æt. 49, admitted August 7th, 1874. Right eye has been subject to inflammatory attacks ever since an injury eleven months ago. It has been twice iridectomised, but without benefit.

On admission.—Right eye generally inflamed and very painful; pupil closed; cornea and iris in contact.

Left eye irritable and intolerant of light, the pupil is active, and there are no signs of inflammation.

Right eye excised. Symptoms of irritation of left eye disappeared shortly after the operation.

CASE 2.—Henry H—, æt. 16, admitted April 13th, 1876.

Left eye lost from an injury some months ago. Has never been able to work since on account of weakness of right eye.

On admission.—Left eye is shrunken and painful. Right eye irritable and intolerant of light ; pupil active ; no signs of inflammation.

Remains of left excised. The following day the irritation and intolerance of light of the right eye had almost subsided.

CASE 3.—A girl, æt. 5, received a wound in the ciliary region of the left eye with the point of a scissors' blade. The eye became inflamed and painful. The right eye became irritable and intolerant of light ; its pupil, however, remained active, and there were no signs of inflammation. After three months' treatment the parents consented to have the left eye, which had by this time begun to shrink, excised ; the irritation and intolerance of light in the right eye quickly subsided.

CASE 4.—William G—, æt. 10, was first seen on August 29th, 1876. Right eye, lost eighteen months ago after scarlet fever, is shrinking and tender on pressure ; pupil blocked by opaque material.

Left eye is irritable and intolerant of light. Recommended to have right excised.

October 9th.—Patient did not attend again till to-day. Both eyes were in much the same condition ; no signs of inflammation in left. Right eye excised.

The irritation and intolerance of light in the left eye quickly subsided.

CASE 5. *Sympathetic irritation caused by anterior synechia.*—Robert W—, æt. 3, was first seen on July 6th, 1874. Right eye wounded near margin of cornea with scissors ; prolapse of iris. Left eye extremely irritable and intolerant of light.

Injured eye to be bound up with lint soaked in belladonna lotion. Left eye to be bathed with the lotion three times a day.

July 23rd.—Right eye inflamed and painful ; no anterior chamber. Left eye irritable and intolerant of light. Iridectomy upwards was performed in the right eye.

August 3rd.—Anterior chamber in right eye re-established ; irritation and intolerance of light of left have almost subsided.

Again, we meet with cases in which, although none of the symptoms of "sympathetic ophthalmia," as defined at the commencement of this paper, are present, the mischief may, nevertheless, be looked upon as of sympathetic origin. The following will serve as illustrations.

Cases which, although not presenting the symptoms of an adhesive Choroido-iritis leading to ultimate destruction of the Eye, may, nevertheless, be looked upon as of Sympathetic Origin.

CASE 1.—Patrick D—, æt. 22, attended amongst the out-patients on October 5th, 1873. Right eye blind, shrunken, and painful; was lost seven years ago from disease. Left eye presented dense pannus, with ulceration of cornea; lids are not granular.

May 5th, 1874.—Left eye continues in much the same condition in spite of almost continuous treatment. Right eye excised.

November 3rd, 1874.—Shortly after excision of the right eye the left began to mend; the ulcer on the cornea has healed, and pannus has entirely disappeared.

CASE 2.—A boy, æt. 12, was under my care last winter. The left eye had been lost two years, was shrunken, and quite blind; scarcely painful. The right was affected by dense pannus and corneal ulceration. I excised the left eye; the right almost immediately began to mend, and soon entirely recovered.

Three similar cases are recorded by Dr. Warlomont, of Brussels, in the report of the "Fourth International Ophthalmological Congress" held in London, August, 1872.

The two following cases are instances of a slow form of atrophy of the choroid which I believe to have been brought about by irritation caused by the stump of a long-lost eye.

CASE 1.—George D—, æt. 44, was first seen on November 7th, 1876. Right eye, the sight of which was lost twenty

years ago from an injury, has dwindled down to a small irregular stump, which has lately become painful and is tender on pressure. Complains of muscæ in left eye, the vision of which has become gradually worse of late; the eye is not painful or inflamed; the pupil is circular and acts to light.

The ophthalmoscope shows thinning of the choroid so that its large vessels are abnormally plainly seen, and increase of connective tissue in the optic disc giving rise to pallor; the retinal blood supply is normal.

November 13th.—Remains of right eye excised. A considerable deposit of bone existed on the inner surface of the choroid.

21st.—Muscæ have almost disappeared, and vision has improved.

CASE 2.—Henry S—, æt. 54, first seen on November 17th. Left eye lost from an injury forty years ago. Sight of right eye has been gradually failing for some months.

On admission.—Left eye is shrunk to a small irregular stump, which is tender on pressure. Right eye presents a corneal opacity with some atrophic changes in choroid around optic disc; reads Snellin 6½ only; no letters at twenty feet.

Remains of left eyeball excised; considerable deposit of bone on inner surface of choroid.

November 24th.—Is still under treatment. Vision of right eye remains the same.

We have now to consider how we may prevent loss of sight from “sympathetic ophthalmia.” The disease having been once set up, almost invariably leads to irremediable blindness, treatment being of but little avail; our object must, therefore, be to prevent its occurrence. Our great safeguard is the timely removal of the injured eyeball. We must not remove injured eyes indiscriminately, but may lay down the following rules, which we shall seldom need to depart from.

1. An eye that has received an injury causing complete disorganisation with escape of the contents and collapse of the globe should be excised at once.

2. An eye which has been so damaged by injury or disease as to be practically useless should be removed if it be

inflamed, irritable, and painful, the sound eye being at the same time threatened.

3. An eye which has been lost from injury or disease and is quite blind should be excised if it become a source of annoyance, even though the sound eye be not threatened.

4. The remains of a lost eye should be removed if the sound one become affected by any intractable form of inflammation, if complaints be made of muscæ, or if there be failure of vision which cannot be remedied by glasses, even though the lost eye be neither inflamed nor painful.

We, however, meet with many cases of injury which will not fit in under any of the foregoing; of course I do not suppose for an instant that any one would think of excising an eye which had received only a moderate injury and still retained good vision. The cases I refer to are such as that mentioned at p. 139, where an eye having been injured, vision, at first fairly good, becomes gradually impaired, the eye meanwhile becoming more and more inflamed, but retaining throughout a certain amount of vision. I have seen such eyes recover, but, on the contrary, they may go on from bad to worse, sympathetic changes being eventually set up in the fellow eye. All we can do in such cases is to watch and insist on excision of the injured eye, even though it still retain some vision, if there be the least threatening of the sound one.

Another class of cases are those in which an eye has been lost from entrance of a foreign body, a shot for instance. The globe retains its proper curvature and tension, it remains for a longer or shorter period inflamed, but subsequently settles down and may give no further trouble. Such cases must also be watched and excision performed if any threatening symptoms present themselves.

When sympathetic ophthalmia has once been fairly established excision of the injured eye does no good. We should, however, perform the operation if only for the sake of our own credit. The patient will certainly be told sooner or later that had the injured eye been removed the sight of the other would have been saved, and may be inclined to blame us for what was not our fault.

In cases of injury to the crystalline lens followed by

opacity and swelling the lens must be extracted. We usually find it considerably softened, and can remove it through a small incision near the corneal margin. The removal of the lens may be associated with iridectomy, or we may leave the iris entire, being guided by circumstances; for instance, if the iris has been injured, the injured portion should be excised; if it prolapse through the wound, removal of the prolapsed portion will save much subsequent trouble.

In some cases we may perform iridectomy without removal of the opaque lens; the extra space given by removal of a portion of iris gives room for the lens to swell and relieves the symptoms, the lens subsequently becomes absorbed. It has been said that injury to the lens associated with lodgment of a foreign body in its substance is certain eventually to destroy the eye, and is very liable to set up sympathetic ophthalmia, and that the only available treatment is excision of the eye so injured. Such, however, has not been my experience; on two occasions lately I have removed the opaque lens, foreign body and all, with a scoop, and the patients have regained very useful vision.

In one case in particular, that of a young man who came to me because excision of the eyeball had been proposed at another hospital, vision, after removal of the lens, was with suitable glasses very near the normal standard.

In cases of wounds followed by anterior synechia the eye may continue inflamed, irritable, and painful, for a very considerable period. The symptoms in such cases are caused by the constant dragging of the circular fibres of the iris, which are firmly fixed at the point of adhesion, upon the radial fibres, and through them upon the ciliary region. Iridectomy performed in a direction opposite to the point of adhesion relieves the dragging and causes the rapid subsidence of the symptoms.

Foreign bodies that have entered the globe should be removed if possible. Should one have lodged in the anterior chamber, in the iris or lens, or should a portion remain outside the globe, we may manage to extract it. But if, as is more frequently the case, the foreign body has become imbedded in the deeper parts of the globe, its position, or even presence, is in most cases only a matter of conjecture, and we shall have

to wait patiently for symptoms indicating excision of the injured eyeball.

The treatment of sympathetic ophthalmia, when once set up, is, as already stated, well nigh hopeless; and, as may be imagined, a very large number of remedies have been employed. Mercury, antimony, quinine, iron, strychnia, and belladonna internally, blisters, setons, bleedings local and general, and of course belladonna and atropine locally applied, are amongst the remedies that have been most frequently employed.

It seems to me that we are most likely to obtain a favorable result by the use of those internal remedies which tend to keep the patient in the best possible state of health. I therefore prescribe good diet, quinine, strychnine, or iron, and some purgative to be taken when required; opium at night, and the occasional application of two or three or more leeches to the temple, if there be severe pain; the use of a solution of atropine, gr. $\frac{1}{2}$ to $\mathfrak{z}\text{j}$, every hour or oftener, the patient to be kept in the dark, and the eye bandaged with lint soaked in belladonna lotion.

The treatment should be persevered with until all symptoms of inflammation have subsided, which will usually be in the course of from three to six months.

REMARKS
ON THE
CLASSIFICATION AND LOCAL DISTRIBUTION
OF DISEASE,
AND PARTICULARLY OF DISEASES OF THE SKIN.

BY P. H. PYE-SMITH, M.D.

ONE of the best recognised errors of the older pathologists was that they regarded diseases as so many more or less material objects, which invaded the body or the mind, and stayed there until they were driven out.

In accordance with this view they defined and classified them like other natural objects. Thus in Cullen's 'Nosology' we see all the known diseases drawn up in classes and orders and genera, each furnished with its Linnæan double name, its definitions and its diagnosis, as if each was as external and independent an object as an animal or a plant.

Moreover, since diseases were separate from the organism they invaded, there seemed to be no reason why they should choose one part of it rather than another for their habitat.

Pathologists now have learnt to regard diseases not as things which exist *in* the body, but as states of the body; and not only as states or conditions, but as *processes*, having a

beginning and an end, like all other processes of life. We have learned that there is no peculiar morbid histology, or chemistry, or physiology, that the cells and the fluids of disease are those of health, and that the natural history of disease is but one chapter of the natural history of man, one section in the great volume of life.

While the conception of diseases as separate natural objects was being displaced from science, it was natural that nosologies should go out of fashion, and that the double Latin names employed as part of the classification should be gradually dropped. We no longer speak of the species of the genus apoplexy as *Apoplexia sanguinea*, *A. serosa*, *A. hydrocephalica*, *A. atrabilaria*, *A. traumatica*, *A. venenata*, *A. mentalis*, *A. cataleptica*, *A. suffocata*; nor do we regard *Colica in genere* as comprising *Colica spasmodica*, *C. pictonum*, *C. stercorea*, *C. accidentalis*, *C. meconialis*, *C. callosa*, *C. calculosa*. The term "apoplexy" simply describes a certain physiological condition; and this may depend on such different causes as compression of the skull, rupture of a blood-vessel, or poisoning by drink. "Colic," again, is a painful contraction of the middle tunic of the gut, and is a symptom pointing to many and diverse possible causes. Even when we divide "Bright's disease" into its tubal or parenchymatous, its interstitial or cirrhotic, and its lardaceous or arterial forms, we only mean that the assemblage of symptoms which Dr. Bright associated with chronic disease of the kidney is found to depend upon anatomical states of the organ which it is possible to distinguish during life.

Instead of the word "disease" denoting a definable, objective existence, it must now be regarded as a purely popular expression, with no scientific meaning, and therefore incapable of scientific definition. A disease is, what the word implies, a state of discomfort, severe or protracted enough to make a patient willing to pay to get rid of it, including such conditions as, though not at present disagreeable, will produce pain or death hereafter. A "disease," therefore, is sometimes a mere collection of symptoms which recur with sufficient uniformity to make it convenient to express them by a single name, as Apoplexy or Chorea; sometimes it is an anatomical change which causes pain or death, or, at least, interferes with

the functions of the part, as Cancer and Acne; or, again, it is the cause of unknown structural changes, which in their turn produce symptoms, as Plumbism.

Obvious as these remarks are, they are perhaps worth repeating until we shall be entirely rid of attempts to classify diseases in natural orders, and genera, and species. Even in the case of actual animal and vegetable organisms, naturalists do not now regard them as independent of one another, and capable of being arranged with more or less ingenuity in artificial systems. We have learnt that all living organisms are the results of laws of life which operate continuously. The lap-dog of to-day is the result of its parents, and they again of theirs, so that each generation is as closely connected with the other by an uninterrupted sequence, as the last contraction of a dilated and hypertrophied heart is connected with the first beat of the *punctum saliens*. Just as it is impossible to classify the varieties of a domestic animal like the dog, so it would be impossible to classify the species of wild animals, but for the failure of multitudes of intermediate links, which have dropped out of the chain (or rather the network) of life. Hence the best zoological classification is that which best represents the process of evolution, of which each species is a term.

If this be true of real objects like animals and plants, much more must it be of the artificial conceptions we call diseases. And yet even now we find pathologists too apt to continue the classification of diseases in the sense in which it was attempted by Cullen, by Sauvages, or by Mason Good. It is surely obvious that no classification can include such diverse material as "vertigo," which is a phenomenon of consciousness, "abscess," which is a collection of corpuscles, and "fever," which is a complex physiological process.

We may fairly attempt to classify the anatomical conditions which we find associated with symptoms; or we may classify symptoms so as to arrange them in a convenient form for diagnosis; or we may arrange diseases according to their etiology, which will be useful for prophylaxis. The first is the method with which we are familiar in works on morbid anatomy from Morgagni to Rokitansky and Virchow.¹ The

¹ This is the way in which the College of Physicians has dealt with the pro-

second is what most of us use in clinical teaching. We select a definite and ascertainable symptom, such as dropsy; we classify the immediate causes which may produce it, and thus by a process of analysis arrive at the anatomical change, which is the second object of our diagnosis; thence we are led to the more difficult problem of the nature and origin of the process which has ended in the anatomical change, and of the means by which it may be checked. We use the third method of classification when we group together the diseases which depend upon excess of alcohol, those which are produced by cold, those which result from malaria, those which depend upon syphilis, and so on. In a previous volume of these reports¹ Dr. Moxon justly insisted on the necessity of a clinical nomenclature of diseases, that is, of naming each one considered as an assemblage of symptoms, which can be recognised and treated. But a nomenclature of this kind is obviously incomparable with one which rests on an anatomical basis. Locomotor ataxia denotes a group of correlated symptoms, a picture of disease which, when once traced by a master hand, is recognised as often as it recurs. Such portraits by Sydenham, or Trousseau, or Addison, or Watson, have a value independent of pathology. They belong to a different order of ideas from those suggested by the *synonym* "chronic interstitial fibroid myelitis of the posterior columns." "Labio-glosso-laryngeal paralysis," again, calls up another recognisable picture; but when we consider the number of centres contained in the medulla oblongata, it is obvious that "bulbar paralysis" can never be a sufficient description of the corresponding anatomical lesion. "Insular cerebro-spinal sclerosis" is an anatomical name, but the disease so called was first described, and is still chiefly known, as a group of symptoms.

It would be absurd to classify ulcers as phagedænic, varicose, weak, syphilitic, indurated, and cellulo-membranous, because an ulcer due to syphilis may be phagedænic in its progress and cellulo-membranous in the tissue it affects. The logical and instructive classification is that which compares diseases where they are comparable, as to their cause, or their

blem of classification. The College list is not a classification of diseases, but of morbid anatomy.

¹ Third series, vol. xv, p. 479.

progress, or the tissue they affect. The "mixed" classifications of diseases (which are sometimes supposed to be practical only because they are unscientific) are like a classification of mankind into Negroes, Asiatics, tailors, Whigs, and lunatics, with a supplementary group of "persons not included in the above orders."

There is, however, a clinical nosology which is really practical, *i. e.* which is useful for diagnosis, prognosis, and treatment. This is classification by *type*. Here again we may borrow an illustration from natural history. It is impossible to define the ruminant animals with the precision of Linnæus or of Cuvier, especially when the numerous fossil forms are included; but it is possible to select certain well-marked genera as the stag, the bull, the camel, and to group others around them, so as to show their affinities to each other and to the rest of the even-toed Ungulates. This is found to be the only satisfactory method, even when animals are regarded solely from a morphological standpoint, without attempting to take in their geological age, or their geographical distribution, or their habits; for each of these aspects of the group of ruminants demands a separate treatment.

In the same way it is instructive to study the diseases of the lungs, now in their pathology as living processes, inflammation, hæmorrhage, apoplexy, and so on; now in their origin, from syphilis, or stone-dust, or mechanical congestion, or dry cold air; and, again, in their local distribution, as they affect mucous membrane, or endothelium, or perivascular sheaths, or pleura. But it is no less important to recognise certain characteristic clinical "types." The young and robust man, with burning skin and bounding pulse, with flushed face and herpes on the lip, is a picture with which we are all familiar, though it is far less common than our classical writers imply, not I venture to think because the sthenic type has altered, but because so striking a form of disease was early noticed and vividly remembered. In such a patient we expect to find the sputa tenacious and rusty, the urine scanty and dark, deficient in chlorides, and with a trace of albumen; we expect to find the absolute dulness, the tubular breathing, the strong vocal fremitus, and possibly the cynosure of the

auscultator, the thin, clear, unmistakeable crepitation of pneumonia. But few cases of pneumonia present this typical aspect. In one direction they pass into the local and secondary pneumonia with pulmonary hæmorrhage of heart disease, in others to the inflammatory œdema of the lungs in morbus Brightii, or to the hypostatic congestive pneumonia of typhus, the acute lobular pneumonia of children, or the catarrhal pneumonia, which is the instrument of destruction in phthisis.

Phthisis, again, is no doubt a complicated and variable process, which must be studied from many points of view, and allows of no "natural" classification of all its forms. Yet we may admit the clinical significance of certain types of consumption. The rapidly spreading pneumonia with caseous degeneration which attacks a young adult with strong hereditary taint, and advances with marked hectic and constitutional symptoms—this galloping consumption—may be fairly contrasted with the chronic form which we often see in later life, springing from long-continued accidental irritation, accompanied with more local than general symptoms, and associated with little caseous and much fibroid degeneration of the lungs, with thickened pleura, and with scanty tubercle in other organs.

The considerations which I have attempted to illustrate have had their due weight in most departments of medicine. Nosologies are out of fashion, and generic and specific names are rarely used; but they still survive in some of the departments which, more or less abandoned to specialists, are farthest removed from the light.¹ Nowhere but in treatises on diseases of the skin do we find the elaborate classifications and the double Latin names employed almost as they were a hundred years ago, and nowhere are generic distinctions and mixed classifications so untenable.

If we inquire what are the physiological processes which

¹ "The special or fragmentary manner in which medicine has of late years been studied and practised, although it may produce greater technical or so-called practical skill, has this unquestionable drawback, that, by splitting up the grand unity of physiology and pathology into isolated parts, it scatters, distorts, or extinguishes the light which each part should reflect upon the others, &c." Dr. Barnes, 'Brit. Med. Journ.,' Aug., 1876.

give rise to the symptoms of cutaneous diseases, we are adopting one method of investigation; if we ask what are the proximate causes of these processes, another. Viewed in the one light scabies is, as Hebra calls it, an eczema of the skin; viewed in the other, scabies has no relation to the eczema of a child's scalp, but is closely related to prurigo senilis, and somewhat more distantly to tropical hæmaturia.

A useful classification of diseases of the skin (as well as of other organs) would be a *therapeutical* one; by which, for instance, we should combine together diseases which are benefited by arsenic, those which improve under mercury, those which are best treated by ointments, and those for which lotions are preferable. This would be analogous to a zoological list of animals which are poisoned by opium, of animals which die in the water, and of animals which cease to propagate in a certain temperature.

Looking again at the anatomical conditions which accompany pain, itching, and other unpleasant processes in the skin, we may profitably regard them according to the depth of tissue which they affect, and thus arrive at a *bathymetrical* classification of skin diseases. We should have, first, the "alluvial" diseases which affect only the cuticle and its horny appendages; next the great mass of those which we call inflammatory, which are confined to the living Malpighian layer of epidermis, with the subjacent papillæ; and thirdly, those deeper processes which start in the sub-papillary layer of the cutis, or in the subcutaneous fascia.

There is, however, another point of view from which the diseases of the skin may be studied, and it is one of the oldest. Mercurialis of Padua divided them in 1572 into diseases of the head and diseases of the body; and, crude as the classification was, it showed an appreciation of the important fact that common characters depend, among other things, upon locality. The anatomical changes of disease are the result of *all* the conditions which accompany their production, and a disease can no more be separated from its local habitation than an animal or a plant from its habitat. We now know, what Linnæus did not, that the geographical distribution of plants and animals is governed by definite laws. Some forms are entirely restricted to a small province, as kangaroos to Australia. So

is it also with diseases. Primary cancer, for example, appears never to affect any but an epithelial structure. On the other hand, there are diseases which are cosmopolitan in the microcosm of the human body. Again, just as animals or plants at first restricted may be introduced into other regions, and there multiply and flourish, so secondary cancers may be sown all over the body, and suppuration, when once extended beyond its original seat, may become as widely diffused as the Hanoverian rat. It was an ignorant traveller who supposed that the droppings of some large animal which he saw in New Guinea were those of a rhinoceros;¹ and he would be an ill-instructed surgeon who expected to find an ivory exostosis of the lumbar vertebræ or a colloid cancer of the eye. Half our power of diagnosis depends upon knowledge of the local possibilities of disease, and hence it is that the surest path to clinical acumen is by the well-trodden floor of the dead-house.

We need some one who will do for pathology in this respect what Mr. Sclater has done for zoology. Meanwhile, as examples of the importance of locality the following will suffice :

After all the discussion of past and recent times on the essential character of pulmonary phthisis there is no anatomical fact which is more persistent, or will, perhaps, in the end prove more important, than the preference of the disease in adults for the upper lobes of the lungs.

The distinction, no less controverted, between croup and diphtheria is to a large extent a local one, by the test of clinical experience ; and there is some reason to believe that the different structure of the mucous membrane of the fauces and pharynx on the one hand, and of the larynx on the other, may go far to account for the different symptoms of the two diseases.

Sir William Gull pointed out several years ago in these Reports² the extreme rarity of abscess of the brain except in consequence of injury to the skull or as a secondary result of other suppuration. Indeed, we may draw a broad line between such tissues as the bones, the skin, and areolar tissues which are exceedingly prone to the formation of abscess, and the lungs, the liver, the kidneys, and the spleen, where it is almost un-

¹ The animal turned out to be an emu.

² Third series, vol. iii, 1857, p. 261.

known, except as a secondary result. Exceptional cases like the single hepatic abscess of the tropics not due to portal pyæmia serve only to point the general prevalence of the rule.

That there is a very definite local distribution of many diseases is beyond doubt. The explanation of the distribution is often difficult or impossible, for it is the result of many causes, most of which are still unknown. The simplest is the presence or absence of the anatomical structures which are the real seat of the morbid process. Thus, that enteric ulcers should be most prevalent in the lower part of the ileum is the natural consequence of the anatomical fact that the characteristic typhoid lesion is a lesion of the solitary lymph-follicles; and where these are most closely and numerous aggregated, in Peyer's patches, there the disease will necessarily be most conspicuous; where they are comparatively scanty, as in the colon, typhoid ulcers are less frequent; and in the stomach and duodenum they are rare. Why the pair of Peyer's patches which are placed far away from the rest and named tonsils should escape is hard to say, but typhoid ulceration of the œsophagus where there are no lymph-follicles is no more possible than œsophageal nephritis.

The limitation of true carcinoma to epithelial surfaces has already been referred to. Not less significant is the limitation of the various forms of primary adenoid growths (lymphomata) to organs like the spleen, the liver, the lymph-glands, the tonsils, and other regions where the cytogenic tissue, of which these tumours are the overgrowths, exists. We do not find them in the brain, nor in the muscles, nor in the testes. But, in fact, the whole modern doctrine of tumours rests on the great fact established by the industry and the genius of Virchow, that new growths are formed on the model of the tissue in which they arise.

The laws which govern the local distribution of diseases are found no longer to apply when they are not primary but secondary and induced. True cancer is found every day in the axillary glands which receive their lymph from a cancerous breast; cerebral and pulmonary suppuration are frequent as the result of pyæmia; and syphilitic gummata, which may hold a similar relation to the primary indurated chancre, are found distributed in bone, in muscle, in the brain, and in

glands, almost as if by chance. This fact lends strong support to the view that the diffusion of cancer, of syphilis, and of pyæmia is not due to any so-called constitutional state, to dyscrasiæ, or blood poisons, or nervous influences, or malignant tendencies, or any other of the metaphysical unrealities which still cumber the field of medicine, but simply and solely to the accidental conveyance of definite material particles from the primary seat of disease.¹ The primary origin of morbid structure must be from the healthy structure in which it is found; for if we exclude plants, like the parasitic fungi of the skin or those which infest silkworms in Languedoc, and hydatids which form a morbid growth of their own bodies, and particles of dust and dirt which are introduced into the lungs from without—if we exclude these strictly foreign bodies, every tumour, or abscess, or pimple, or gangrenous spot must be the direct offspring of the natural cells of the part. A cancer does not *invade* the mamma, it does not grow in the mamma, it is a part of the mamma which is living an unusual and mischievous life.² But when a particle of this morbid mammary tissue is carried off to a lymph-gland or to the liver it may grow there like an exotic plant. Doubtless even secondary morbid structures have their laws of local distribution, and from a practical point of view these are also of importance, but probably this distribution depends far more upon the mechanical readiness of conveyance than upon the suitability of the tissue to be infected.

The different forms of *inflammation* do not attack tissues indiscriminately. The catarrhal is characteristic of mucous membranes, the adhesive of serous membranes, while chronic fibroid induration and contraction affect the interstitial stroma of solid viscera, like the liver, kidney, lung, and brain. When we inject iodine into the sac of a hydrocele we expect adhesive and not suppurative inflammation, but a similar injection under the skin would certainly be followed by an abscess. Adhesions do not occlude the nostrils as the result

¹ Within the memory of man scabies was attributed in the great medical school of Vienna to a psoric dyscrasia of the blood, which broke out in the humours of the itch.

² See on this subject the admirable researches of Dr. Creighton in Mr. Simon's Reports—unhappily the last—for 1874-5.

of a severe cold, nor the urethra after a gonorrhœa. If the tissues of the eye are injured, each takes on its own distinctive form of inflammation: the conjunctiva pours out a mucopurulent effusion, the cornea ulcerates or grows opaque, the iris forms adhesions, and the vitreous becomes an abscess.

So with degenerations. Molecular fatty degeneration in the heart is different from the "atheroma" of oil-granules and cholesterine and earthy salts which results from chronic arteritis. Bony plates form in the dura mater and in tendons. Hyaline cartilage ossifies, but elastic cartilage never. Lardaceous degeneration essentially belongs to the middle coat of arteries; miliary tubercle to their perivascular sheaths and to the corresponding tissue which surrounds the smaller bronchi. The same cause, embolism, produces solid wedges in the spleen and kidney, hæmorrhage in the lung and brain, gangrene in the fingers or toes.

Then, again, the mere physical condition of different parts of the body is an important cause of the local distribution of disease. The frequency of ulcers of the front of the legs is not unconnected with the liability of this part of the body to injury. From the days of Aristophanes, when the Athenian citizens' shins were covered with sores from scorching them before the public fires, this localisation has been observed. One of Mr. Hilton's brilliant applications of anatomy to medicine was to show how the frequent occurrence of varicose ulcers over the internal malleolus depends on the fact that immediately below that point there is a communication between the long saphenous and the deep veins.¹

In purely mechanical dropsy, like that due to cirrhosis of the liver, the limits of effusion are obviously due to the laws of hydraulics; and equally so in cardiac dropsies, where gravitation prevents swelling of the face and favours it in the legs. When the effusion of serum is not due to increased intravenous pressure but to chemical change in the blood, as in acute Bright's disease, anasarca is at first universal. Soon, however, it shows its predilection for the genitals and the eyelids and conjunctiva, because the subcutaneous areolar tissue of these parts, loose and free from fat, offers no resistance to the effusion. When a patient suffering from chronic

¹ 'Rest and Pain,' pp. 194-5 (2nd edition).

renal disease rises in the morning, he finds "his eyes puffed up;" by the time he goes to bed or shows himself as an out-patient, there is little or no œdema of the face; and when he goes to bed he can no longer wear the boots he put on in the morning. I believe we may ascribe to the same action of gravity the "lumbar cushion" which has been a traditional sign of renal dropsy since Bright himself pointed it out. It is most marked in the severe but chronic cases, when the patient cannot walk about, but is able to sit up in bed, so that the serum gravitates to the loins, the genitals, and the lower part of the abdomen. Whatever the explanation, we all know that when we see a man with watery eyes, swollen prepuce, and a lumbar cushion we shall find albumen in his urine.

It has long been recognised that papillary growths can only occur upon a free epithelial surface, and need never be looked for in solid viscera or on the endothelium which lines the closed cavities of the body. No less are villous growths a mere local variety of tumours due to their living under water.

In attempting, however imperfectly, to apply the laws of local distribution to diseases of the skin, we may perhaps group them in the following manner:

First, there are those diseases which are local simply because the tissue or organ they affect is really local. A whitlow obviously can only occur where there is a nail, a sty where there is a Meibomian gland, sycosis in the region of the beard. On the other hand, the occurrence of xanthelasma where there are no sebaceous glands, of vesicles where there are no sweat-glands, or of itching where there are no papillæ, serve to determine disputed points as to the true locality of these affections. Practically, however, the distribution of the several organs which compose the skin is so nearly universal that the diseases whose locality may be explained by that of the structures they affect are comparatively few.

There are other local varieties of cutaneous diseases which depend, not on any peculiar structure of the parts affected, but upon the accidents of the irritating cause. This is the ready explanation of the simple traumatic dermatitis, which is known as grocers' itch (lichen, eczema, or eczematous lichen), in hands which are exposed to irritating substances. Dermatitis

intertrigo again results from the friction of two surfaces covered with sweat or urine; the so-called eczema of the neck of children, the breasts of women, and the nates of those who walk in hot weather. The simple inflammation of the skin which follows exposure to sun and wind is another familiar example; the local distribution of "eczema a sole" is just as simple as that of "eczema a sinapi," which follows a mustard poultice. Most of these traumatic inflammations of the skin are called eczema; but the name is misleading, and tends to confuse the already difficult question of the etiology of true idiopathic eczema. As Professor Hebra pointed out, and as every one knows, we can make an artificial eczema at will. An irritant of sufficient strength and applied for a sufficient time produces the pain, heat, redness, and swelling characteristic of all inflammation, with the slight febrile disturbance which accompanies it. Exudation of plasma and leucocytes from the capillaries follows, vesicles and vesico-pustules form; they run together and burst, the horny cuticle is thrown off, and a raw, weeping surface results. If the skin be less susceptible, or the irritant less powerful and more continuously applied, cell-proliferation takes the place of exudation; the most vascular parts of the affected organ—the papillæ and the hair follicles—enlarge by the overgrowth of ill-formed tissue; and the skin becomes thickened, dry, and papular. In the one case we have so-called acute eczema running through the stages of *E. rubrum*, *E. vesiculosum*, and *E. madidans*; in the other, chronic eczema with its papules and its thick and roughened skin. Exactly the same process follows the irritation of the itch-mite, and hence Hebra suggestively calls scabies a parasitic eczema. The local distribution of this dermatitis depends—first, upon the instinct of the animal which causes it; secondly, on accidental facilities for contagion; and thirdly, on the proneness of different parts of the skin to take on the simple traumatic or eczematous form of inflammation. The female acarus chooses its habitat in the thinnest parts of the skin which are easiest to burrow, between the fingers and the toes, on the genitals and the nipples. By direct contagion the inflammation spreads much farther than its exciting cause, so that large patches of scabies on the fore-arms and the abdomen may be found without a trace of the

parasite. The definite local distribution of the dermatitis of scabies, with its modifications in accordance with sex and age, are so well known, that a diagnosis can in most cases be formed from this circumstance alone. It is, however, remarkable that the face and scalp, which are so prone to the same form of "eczematous" inflammation from other causes, are almost entirely free from the eruption of scabies. The rare exceptions which have been noticed are said to occur among children.

One of these exceptional cases lately occurred in our clinical wards, a summary of which I subjoin. It is the more remarkable for the large bullæ which formed on the face, the feet, and other parts, as in a case recorded in the fifteenth volume of these 'Reports,' by Dr. Fagge (p. 333). The appearance of the eruption on the face is well shown in the accompanying plate.

"Severe Scabies affecting the Face.—Charles D—, æt. 8. A brother and a sister have the itch. Three weeks ago pimples appeared with little white heads, between the fingers and on the abdomen, which itched a great deal and gradually spread to the arms, legs, and face. Large blebs then appeared, at first transparent, then purulent. In this state he was brought to the hospital, not for the affection of the skin but for congenital phymosis, and Mr. Jacobson sent him in under my care.

"On admission, there were vesicles and blebs on the right cheek and chin and on the ears. Bullæ on the right shoulder as big as a threepenny-piece, some full of serum, others of pus. Inner side of the elbow and forearm occupied by vesicular and raw 'eczematous' patches. Bullæ and pustules on the back of the hand; one large bleb in the palm. Left arm not so much inflamed, but left hand more so, with three great bullæ in the palms. Scattered pustules and 'eczematous' patches on the back and chest; more numerous, with yellow crusts, below the navel. Pubes, penis, and scrotum red, raw, swollen, and weeping. Inflamed skin down the inside of both thighs, with one or two large bullæ. Left leg worse than right. Bullæ and pustules on inner aspect of sole of left foot; toes free."

Before I saw the boy the house physician had discovered an acarus in a crust from the hand, and eggs were afterwards

found. The characteristic 'runs' was present in one palm. No sign of the parasite was found on the face, the eruption on which probably resulted from transference of contagious pus by the patient's hands. Storax ointment was applied for three or four days, but the pain and irritation being severe, and fresh pustules appearing, he was put in a warm bath and then dusted over with oxide of zinc. In another week he was much better. Three weeks after admission there were only a few scabs on the face and ear, and the patient was discharged well after being just a month in hospital.

To call the bullæ on the face of this boy pemphigus, would be a blunder in diagnosis. It was the recognition of the true nature of the case by Dr. Fagge (who happened to see it before myself) which alone led to its cure, just as his own patient above referred to would never have been successfully treated unless he had discovered the fragment of an acarus. All bullæ are not pemphigus, just as all vesicular dermatitis is not eczema.

Apart from the exciting cause of dermatitis, we find that whenever it affects the lower extremities it is apt to assume a peculiar form, with chronic congestion and hypertrophy. The peculiarity of this chronic "eczema" of the legs is due to the mechanical conditions of the circulation in dependent parts, and is often associated with varicose and indolent ulcers of the same region. The same treatment which Mr. Hilton enforces in the case of such ulcers is the most appropriate and useful in the corresponding form of eczema. That this is a strictly local example of disease is shown by the fact that exactly the same condition may ultimately be reached whatever the cause of the original inflammation. In many cases, no doubt, it is the extension of a true idiopathic eczema, which has been cured elsewhere but becomes chronic and inveterate in these parts. In others, it obviously spreads from an ulcer due to injury. Lately I have had a remarkable instance of the same condition depending on a primary syphilitic dermatitis.

Chronic dermatitis, syphilitic in origin.—Rhoda G—, æt. 51, was admitted into Miriam Ward, under my care, May 27th, 1876. The family history was full, but threw no light on the disease. She was married, and had children, but had

never miscarried. She had been in pretty good health and doing her household work until twelve months before, when she got her feet wet, had a shivering fit, and found her legs begin to swell. At the same time "clear watery pimples the size of a pin's head" formed, with a good deal of pain. Over both legs below the knee and on the feet these vesicles appeared, ran together, and a yellowish crust formed over them, which returned after removal. For the last six months the swelling, pain, and discharge had increased.

"The patient is a spare dark woman. There are no signs of internal disease, and the urine is normal. Occupying the pubes, groins, vulva, and hypogastrium, is a raised, dry, leathery patch of skin, of a dark purplish-brown colour, without pimples or vesicles. Near the umbilicus is a pustule with a crust. The axillæ and popliteal spaces are deeply stained of a brownish tint, without other change. On the back and shoulders are some pimples and scratch-marks, apparently due to pediculi and unconnected with the preceding condition. Both legs, from two or three inches below the knee, are uniformly swollen, the skin being irregularly raised, dry, leathery and dark, with a few small yellowish scales. Covering the dorsum of both feet and the toes is "a thickly mammillated eruption, pink in colour, made of pyramids with fissures a quarter of an inch deep between them, from which a yellow fœtid discharge wells up. The nails are gone, but the soles are nearly free, and there is a band of healthy skin round the right ankle. The tongue is scarred and fissured, and the lips excoriated." (See Plate II.)

The condition of the tongue and the dark maculæ made me believe that most of the disease was of syphilitic origin; but what decided the diagnosis was learning that eleven years before this patient was in the hospital under Mr. Bryant's care in the syphilitic ward. She had then sores on the vulva, armpits, hams and feet; she was readmitted in a similar condition the following year, and it was then that she lost the nails of her toes. After three months' stay in the ward she was sent out well, and Mr. Bryant tells me that he remembers the case as one of condylomata of the vulva and general syphilis, which was cured by the local application of calomel in powder and other specific treatment.

I ordered her ten grains of iodide of potassium in compound decoction of sarsaparilla, and calomel to be powdered over the papillary growths. By the 8th of June the lips were nearly well. Rest in bed brought down the œdema of the legs, and careful bandaging further improved their condition. The left leg was dressed with zinc ointment, the other with calomel, and the latter recovered more rapidly. In July I changed the iodide for perchloride of mercury; and on the 2nd of August it is noted, that "the eruption is slowly disappearing, the right leg is much better than the left."

Sept. 7th.—"Right foot is very much better; the papillæ are now almost level with the skin, and those on the left are rapidly diminishing." The improvement continued, and she went out at the end of the month, with her legs and vulva only showing the same dark stain as the armpits and the feet in a condition of slight ordinary eczema.

It was a curious coincidence that, in the same ward in which this patient lay, there was another under the care of Dr. Fagge, whose condition agreed remarkably with that just described. His patient also was a woman past middle life, and the appearance of the diseased skin, which formed great patches over the axillæ and the trunk, was almost exactly the same. The diagnosis was at first obscure, but the syphilitic nature of the disease was cleared up by the results of treatment.¹

At the same time an Irishman (Michael B—, æt. 55) was attending among my out-patients whose legs presented almost exactly the same appearance as those of Rhoda G—. The whole skin of both legs below the knee and of the feet, excepting the soles, was enormously thickened and covered with close-set papillæ, from which exuded a thin sero-purulent discharge. Everywhere the integument was raw, red, and weeping. At some points it resembled the granulating surface of an œdematous ulcer, at others it closely simulated the appearance of a papilloma. I sent him into the hospital under the care of Dr. Wilks, and after three or four weeks' rest in bed, with exhibition of laxatives, the œdema had subsided, but the watery condition of the feet and legs remained. Soft soap and oil were then diligently applied. The elephantine aspect

¹ This patient has again entered the hospital with a return of the disease.

disappeared, the papillæ became smaller and then disappeared from view, the discharge diminished, and when I took charge of the ward about three months after his admission his legs presented nothing but the ordinary characters of a chronic "eczema" already on the way to cure. The raw surfaces gradually dried up and extensive desquamation took place. Zinc ointment was then applied, and the legs carefully bandaged for several days before he was allowed to get up, and now at the end of the year he is cured and fit to leave the hospital.

These cases seem to me instructive in showing how much the aspect of a disease depends on local position and on time. The condition of the legs of both my patients was the same, but in the one the chronic dermatitis with hypertrophy of the papillæ and thickening of the cutis was the result of syphilis, in the other it occurred without the slightest ground for that supposition. We gain nothing by calling the Irishman's case one of eczema, and we should have made a serious blunder in applying that term to the woman's case. In Dr. Fagge's patient the curious resemblance of the condyloma-like patches to those in Rhoda G— depended, no doubt, first, on the identity of the cause; and, secondly, on the long continuance of the syphilitic dermatitis.

Universal eczema of an acute type, which shows no predilection for special regions, differs in other particulars from the ordinary disease, and should, I think, be called simply acute dermatitis.¹ The following is a remarkable example of it which I have met since I began to write this paper.

Acute general dermatitis.—A woman, æt. 39, was an out-patient of mine last October with chronic tubal nephritis. Dropsy had only been noticed for about three months. She was afterwards admitted into Dr. Pavy's ward, and there suffered from severe pericarditis with effusion. When she came under my care again last Christmas I found that the effusion had disappeared, and, as it afterwards appeared, adhesions had taken place in the pericardium. There was no pleuritic effusion, only moderate œdema of the lungs, and

¹ See a paper by Dr. Wilks in the seventh volume of the present series of Reports.

the case, in fact, was one of ordinary chronic Bright's disease.

On December 30th, 1876, I noticed a papular eruption on the face, and in two days this had spread all over the body. There were the vesicles, red surface and weeping patches, seen in *eczema vesiculosum*, *rubrum*, and *madidans*, with intense irritation and subsequent desquamation. On the whole, however, there was less moisture and more rapid separation of flakes of skin. The hands, arms, face, and groins were earliest affected, but at this time no part could be found free from the eruption. The temperature rose to 102° ; the tongue was moist, furred, and fissured. She died on the evening of the 3rd of January.

At the post-mortem examination I found that except the scalp there was literally no part of the skin free from the eruption. The skin had separated from the palms and soles in great flakes like the "gloves" thrown off after scarlatina. The thin cuticle of the back had become detached over large spaces of raw skin, and the rest of the face, trunk, and limbs was covered with crusts and scales. There was only slight œdema of the glottis, considerable congestion and œdema of the lung, with recent pleurisy at one base, but no carnification or effusion. The pericardial adhesions could still be separated, and the heart was normal, without valvular disease or hypertrophy of the left ventricle. The kidneys were flaccid, yellow, shrunk and in the last contracted stage which the large white kidney undergoes. But there had been no convulsions, vomiting, coma, or other uræmic symptoms, and the acute dermatitis was certainly the immediate cause of death.

I submit that to all such forms of disease, even more than to chronic dermatitis of the legs, inflammation from exposure to direct irritants, and dermatitis due to scabies or to syphilis, it is inexpedient to apply the term *eczema*, simply because their anatomical condition coincides with that of true moist tetter.

An inflammation precisely like that of *eczema* in its anatomical characters can be produced artificially or by the presence of an *acarus*, or (rarely, as in my case) by syphilis, or by any other cause of inflammation; and it is surely desirable, not only in the interests of pathology but for the practical

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objects of prognosis and of treatment, to distinguish such conditions from true eczema. Eczema, if we mean to denote by the term a disease and not a mere anatomical lesion, is, in the first place, *idiopathic*, that is, it does not arise from any known irritant; it is *chronic* and does not tend to spontaneous cure; it is prone to *recur* after healing; it is amenable to treatment by *arsenic*. But perhaps its most characteristic feature is its distribution in certain definite *regions* of the skin. In the most typical cases it is confined in adults to the flexures of the elbows and knees. When it affects the trunk it is still its flexor surfaces, the abdomen and the neck, that it chooses. In children, eczema, either of the serous or the pustular form, affects the ears, the face, and the scalp. On the other hand, true eczema rarely spreads to the back and shoulders, to the elbows or the knees, the palms or the soles.

Psoriasis is a disease much more easy to define than eczema, because its anatomical lesion—the large, imbricated, pearly scales, seated on red and thickened patches of skin—is a condition which cannot be imitated by the irritation of heat or wind; nor by direct application of mustard or tartar emetic; nor by the presence of the acarus; nor by syphilis; nor by the unknown cause of true eczema. The various forms of dermatitis we have been discussing are alike in their morbid anatomy, and pass through the same series of stages more or less completely and regularly—hyperæmia (roseola), diffuse exudation (erythema), formation of papules, vesicles, weeping surfaces, pustules, and crusts, drying up and desquamation. But psoriasis is so uniform in its aspect that its peculiarities of local distribution are very obvious. Apart from its anatomical characters—its itching, its reaction to arsenic internally and to tar locally, its probable connection with gout, its chronic course and almost certain recurrence—psoriasis may almost be defined by its occurrence on the elbows and the knees, and its avoidance of the palms and the soles. What is the reason of this distribution we do not know: but as the skin of one elbow is more like that of the other, both in structure and in circumstance, than any other part, so that of the knees comes next.

These two common diseases, the dry and the moist tetter

of our fathers, are often contrasted in their anatomical appearance. They are no less so in their local distribution; and, like all objects which admit of contrast, they have many and important points of resemblance. Of the two, psoriasis (from which, of course, we exclude the squamous stage of eczema—psoriasis diffusa—which has no more to do with it than the scaly stage of the rash of scarlatina and the scaly eruption of syphilis) is the more special, the more differentiated, form of disease.

Erythema, like eczema, is a term which has been applied to many affections having no common character but their anatomical condition. Like eczema, it can be produced by direct irritation. A slight erythema follows the irritation of a mustard plaster. *Erythema leve* is apt to appear on the distended skin of anasarca. But whenever we succeed in defining an erythema by more than this general character of “a dermatitis less severe than the vesicular or pustular stage,” we see evidence of its local distribution; for what are the rashes of scarlatina, of measles, and of copaiba-poisoning, but erythemata of which we know the cause? Idiopathic *Erythema multiforme* of Hebra affects the back of the hands by preference, and is very rarely seen on the face or trunk. *Erythema nodosum*, by its characteristic form and course, by the sex and age of the patients it usually attacks, by its probable connection with rheumatism and its reaction to remedies, lays claim to be admitted as a distinct disease, due to a constant cause and following a characteristic course; and its local distribution is no less characteristic, for erythema nodosum is practically confined to the corresponding regions of the arms and legs, and in most cases to the latter.

If we turn to the cutaneous affections which are only known as secondary results of a disorder apparently affecting the whole system, we find the principle of local distribution in its most familiar aspect. The petechiæ of typhus are most marked on the trunk and limbs; erysipelas almost always begins about the inner canthus and the nose, and when idiopathic is almost always *E. capitis*; the enteric rash is nearly confined to the abdomen and thorax; and the more universal

rashes of syphilis, and variola, and measles, have yet their seats of predilection.

One of the most striking instances of the local distribution of cutaneous diseases is afforded by that singular affection known from the time of the ancients as *Zona*. Dermatologists, especially since Bärensprung's writings on the subject, have agreed that the distribution of this singular disease depends on the course of the nerves supplying the part it affects. Even then it is remarkable that the intercostal nerves are so much more frequently the seat of the disease than others, while those of some regions, as the limbs, seem almost entirely to escape. The evidence for the nervous origin of the disease is irresistible when it covers the region supplied by the second and third dorsal nerves and follows their intercosto-humeral branch down the inside of the arm. The neuralgia which so often accompanies or succeeds the eruption is another argument; and both are confirmed by the discovery of actual congestion and swelling of the nerve at its root.¹

I have, however, observed that the distribution of the eruption is often not precisely in the course of any one nerve. The ordinary *zona* of the trunk commonly preserves a too horizontal course, and sometimes runs round the abdomen as if the lumbar nerves had the same regular distribution as the dorsal. The following cases of irregular *zona* will illustrate this fact:

Wm. L—, æt. 29, came to me in October, 1875, with well-marked *zona* of the left side. The papules and vesicles began opposite the tenth dorsal vertebra, then ran along the ninth rib and ended at the sternum at the sixth rib.

Wm. T—, æt. 16, out-patient. A typical eruption. A group of papules at the lower end of the dorsal groove (posterior branch of fifth lumbar nerve), another over the left sacro-iliac joint; two ulcerated patches on the left buttock (iliac branch of ilio-hypogastric); papules in front of the trochanter (external cutaneous); a large irregular ulcerated patch on the pubes and hypogastrium just to the left of the linea alba (hypogastric branch of ilio-hypogastric); and, lastly, a group of vesicles

¹ Beside the observations of Danielssen and Bärensprung on this point, Dr. Haight, of New York, has observed the same fact. See the figure copied from his paper in Neumann's '*Hautkrankheiten*,' fig. 14.

over the rectus femoris just below the sartorius (crural branch of genito-crural).

Jas. M—, æt. 18, out-patient. Characteristic left zona. The vesicles begin at the seventh, eighth, and ninth dorsal spines, pass over the angle of the scapula, under the axilla and nipple to the fifth and sixth costal cartilages, where the eruption ends.

Thos. N—, æt. 47, admitted under my care Nov. 22nd, 1876, with zoster of the right side, two days after it began. The band of reddened skin, with papules, vesicles, and bullæ, is from three to three and a half inches broad. It begins somewhat to the left of the second and third lumbar vertebræ, crosses the tip of the last rib in the axillary line, and ends on a level with the umbilicus in front. The course was then too horizontal to correspond with that of the lumbar nerves.

Even when a disease is localised by the special tissue it attacks it may again select more frequently a certain region. Zona selects the intercostal above other nerves. *Tinea versicolor* is more frequent on the chest than elsewhere, and is almost unknown on the limbs or face, apparently because warmth and moisture (as distinguished from cold water) favour its growth.

But without attempting to exhaust the subject, I will end this paper with an enumeration of some of the most important cutaneous diseases which show marked local predilection, and with this local classification will offer examples of classifications on other bases.

A scientific classification of any "diseases" I have tried to show to be impossible, since diseases are not scientific objects and are incomparable with one another; but they may be classified with advantage from many different points of view, as physiological processes, as anatomical changes, as results of antecedent conditions, and so on. And the classification and pathology and treatment of diseases of the skin can only be satisfactory when they are constantly studied as only an artificial section of the greater study of medicine, just as the "seats and causes of disease" can only be properly investigated in the light of the still wider science of biology.

I.—*Examples of classification of diseases of the skin regarded as physiological processes (pathological arrangement).*

Acute inflammations:

Hyperæmia, diffuse exudation and cell-proliferation—*e. g.* scarlatina, morbilli, syphilis, roseola, and erythemata.

With venous congestion—*e. g.* erythema nodosum.

With œdema—*e. g.* urticaria.

With necrosis—*e. g.* furunculus, anthrax.

Localised in papules—enterica, syphilis, eczema, prurigo, strophulus.

vesicles—eczema, zona, variola, scabies, herpes, varicella.

pustules—impetigo, variola, scabies, syphilis, sycosis, acne.

blebs—pemphigus, scabies, syphilis (rupia, pemphigus neonatorum).

Diffused, after rupture of vesicles, pustules, or blebs—eczema madidans, scabies, &c.

Desquamating during involution—scarlatina, eczema squamosum, &c.

Chronic inflammations:

With over-production of epidermis.—Psoriasis.

With fatty degeneration.—Xanthelasma.

With hypertrophy.—Elephantiasis (Arabum), molluscum fibrosum, &c.

With contraction.—Cheloid (of Alibert).

With œdema.—Elephantiasis (lymphatic), œdema durum.

With venous congestion.—Acne rosacea, pernio.

With ulceration.—Lupus, syphilis, lepra.

New growths.—Xanthelasma tuberosum, lupus, lepra, tertiary syphilis, cancer.

Atrophy.—The senile skin (Neumann's 'Hautkrankheiten,' p. 286).

Hypertrophy.—Ichthyosis, cornu cutaneum, clavus, verruca.

Hæmorrhage.—Traumatic (flea-bites), typhus, scurvy.

Pigmentation.—Maculæ after syphilitic or other chronic inflammation, melasma supra-renale, chloasma, icterus, ephelis; leucoderma.

Congenital malformations.—Ichthyosis, cutaneous nævus.

Neurosis.—Pruritus.

Anomalies of secretion:

Increased or diminished.—Seborrhœa, xeroderma (pityriasis tabescentium).

Hyperidrosis, anidrosis, chromidrosis, &c.

Obstructed.—Molluscum sebaceum, comedo, milium, acne (punctata).

Sudamina.

II.—*Diseases of the skin regarded as the result of antecedents (ætiological classification).*

Due to the irritation of sun, wind, &c.—"Eczema" solare, and other forms of simple ("erythematous" and "eczematous") dermatitis.

Due to the irritation of friction.—Intertrigo.

Due to the irritation of animal parasites.—Scabies, prurigo pedicularis, much of impetigo capitis in children.

Due to the irritation of vegetable parasites.—Favus, ringworm, &c.

Due to the irritation of scratching.—Much of the papular eruption of scabies, and prurigo.

Due to the irritation of drugs locally applied.—Eczema mercuriale; the eruptions caused by arsenic, arnica, tartar emetic ointment, &c.

Due to the presence of poisons in the blood.—The rashes caused by belladonna, copaiba, shell-fish, &c.; boils from bromide of potassium; hydroa from iodide (?); tar acne; acute dermatitis from rhus and semecarpus.¹

Secondary to general disorders of the whole body.—The rashes of syphilis, scarlatina, morbilli, typhus, enterica; herpes (labialis); scurvy; gouty psoriasis and eczema; rheumatic erythema (peliosis).

Due to disturbance of innervation.—Zona.

III.—*Diseases of the skin regarded as objects of cure (therapeutical classification).*

By external applications	{	Sulphur.—Scabies.
		Mercurial ointment, &c.—Phthiriasis.
		Hyposulphites, and other parasitocides—Ringworm and other tineæ.
		Lotions.—Moist eruptions. ²
		Ointments.—Dry eruptions. ²
By internal remedies	{	Tar.—Psoriasis and chronic scaly eczema.
		Caustics.—Lupus.
		Mercury.—Syphilodermata.
		Arsenic.—Psoriasis, chronic eczema, pemphigus.

IV.—*Diseases of the skin regarded in their subjective effects.*

Peculiarly painful.—Zona, erythema nodosum.

Itching.—Scabies, psoriasis, prurigo, eczema, urticaria, icterus (often).

Negative.—Syphilis, typhus, enterica.

¹ See a case by Dr. F. Taylor, 'Med. Times and Gazette,' November 6th, 1875, p. 519.

² See a paper by the late Professor Bennett, of Edinburgh, in the 'Practitioner,' vol. i, p. 211 (1868).

V.—*Diseases of the skin regarded as anatomical conditions of certain layers, organs, or regions.*

A. *Bathymetric distribution.*

The horny cuticle.—Ichthyosis, cornu cutaneum, clavus, sudamina, xeroderma, psoriasis.

The Malpighian rete and papillæ.—Eczema, scabies, secondary syphilis, exanthems, erysipelas, and other forms of dermatitis: psoriasisnot leaving scars.

The deeper cutis and subcutaneous fascia.—Zona, variola, phlegmonous erysipelas, tertiary syphilis, lupus, lepra, carcinomaleaving scars.

Elephantiasis, xanthelasma, sclerodermanot ulcerating.

B. *Distribution to organs.*

Sweat-glands.—Sudamina.

Sebaceous glands.—Miliun, comedo, acne, molluscum contagiosum, steatoma, lupus erythematosus.¹

Hair sacs.—Ringworm, favus, &c.; sycosis; furunculus.

Nails.—Onychia, onychomycosis, psoriasis, atrophy.

C. *Surface distribution.*

Scalp.—Eczema (especially impetigo and porrigo), phthiriasis, favus, ringworm, area (of Celsus).

Face.—Dermatitis from exposure, ephelis, rashes of smallpox, measles, and syphilis, erysipelas, lupus, acne.

Forehead.—Supraorbital zona, chloasma.

Eyelids.—Xanthelasma, milium and sebaceous cysts.

Nose.—Lupus, acne rosacea.

Bridge of nose and cheeks.—Lupus erythematosus.

Nose and lips.—Eczema and impetigo of children.

Upper lip.—Symptomatic herpes.

Lower lip.—Epithelial cancer.

Beard.—Sycosis.

Ears.—Eczema, xanthelasma tuberosum, tophi.

Neck: front.—Intertrigo.

nucha.—Furunculi.

Shoulders and back.—Prurigo pedicularis, acne, anthrax.

¹ This curious affection, so named by Cazenave, had been previously described by Bielt as *Erythème centrifuge*, and by Hebra as *Seborrhæa congestiva*. It is the *Scrofulide erythémateuse* of Hardy. Its real seat in the sebaceous glands, and its distinction from lupus, have been demonstrated by Neumann and by Dr. Geddings, of New York.

Chest.—Rashes of scarlatina, syphilis, and other exanthems; tinea versicolor.

Breasts.—Intertrigo.

Nipples.—Scabies.

Abdomen.—Rash of enterica.

Sides of trunk.—Zona.

Genitals.—Eczema, scabies, elephantiasis scroti, herpes præputialis.

Nates.—Scabies (in children), furunculi, intertrigo, congenital syphilis.

Elbows: extensor side.—Psoriasis, xanthelasma tuberosum.

flexor side.—Eczema, xanthelasma planum.

Forearms and back of hand.—Erythema, hydroa (erythema iris).

Wrist and between fingers and toes.—Scabies.

Fingers and toes.—Pernio.

Palms and soles.—Syphilis (especially squamosa and bullosa).

Axilla and groin.—Eczema.

Knees: extensor side.—Psoriasis.

flexor side.—Eczema.

Legs.—Chronic dermatitis, elephantiasis, erythema nodosum.

VI.—*Diseases of the skin as they specially affect different ages.*

Infancy.—Congenital syphilis, icterus neonatorum, nævi.

Eczema, intertrigo, impetigo capitis, strophulus.

Childhood.—Scarlatina, morbilli, roseola, erythema, ecthyma, molluscum sebaceum, eczema of face and scalp, ringworm and favus, pernio.

Adolescence.—Lupus, acne (esp. males), erythema nodosum (esp. females).

Early adult life.—Enterica, secondary rashes, psoriasis, sycosis, lupus.

Later adult life.—Psoriasis, tertiary syphiloderma, xanthelasma, epithelial cancer.

Old age.—Rodent ulcer, epithelial cancer, prurigo pedicularis.

DESCRIPTION OF PLATES.

PLATE I.

SCABIES.

(Acute Bullous Dermatitis of the Face.)

PLATE II.

SYPHILIS.

(Chronic Hypertrophic Dermatitis of the Leg.)





EMPYEMA AND ITS TREATMENT.

By JAMES F. GOODHART, M.D.

It is now more than thirty years since our 'Reports' contained any record of cases of paracentesis thoracis. In 1844¹ Dr. Hughes and Mr. Cock published a joint paper on the subject, and, as might have been expected, facts emanating from such distinguished and cautious observers received considerable attention. Indeed, it may be said that the operation of chest-tapping, though as old as the profession of medicine itself, did by that means receive a considerable stimulus; and it was by that paper, perhaps more than by that of any other writer, that the operation was placed on a proper footing, and this notwithstanding the expressed opinions of others on the subject were even then both numerous and exhaustive. The great merit of the paper referred to consisted in the fairness with which results were stated; there was none of the partisanship on either side which often so much damages the most valuable statistics, and no particularly roseate hue was ascribed to colours which to ordinary observers might seem but commonplace or even sombre. Then, too, the operation of paracentesis thoracis held at that time a somewhat insecure tenure of existence. Many distinguished authorities had declared against it. Individual experience does not seem to have been at that time large enough to outweigh such dicta; and though those who had tried it were in many cases favorably impressed

¹ "Observations on Paracentesis Thoracis," 'Guy's Hosp. Rep.,' series 2, vol. ii, 1844, p. 48.

by it, still it was not till Dr. Hughes and Mr. Cock published facts that there was ground for the support of one side or the other. They decided in favour of thoracentesis, and since then, it needs no telling, the operation has been often repeated, and every one recognises not only its advantages but its absolute necessity for the saving of life in very many cases. I suppose there are few physicians who have not seen several cases at least; and the rules for the treatment of fluid in the chest may almost be said to be as simple as they are dogmatic. Dr. Hughes and Mr. Cock take up the subject of paracentesis thoracis in general, and in so doing there is, perhaps, a little difficulty at arriving at other than general results, for the reason that chronic effusions, whether serous or purulent, and this is the same as saying simple and severe cases, are all mixed up together. The treatment of chronic serous effusion, however, requires no further elucidation at the present time; whether paracentesis can be considered a proper method of procedure has been quite definitely settled, and the benefits of the operation have been so manifest and repeated so often that no one would dream of disputing its position. I do not by this mean to say that serous effusion, either acute or chronic, presents no difficulties in its treatment. There are cases, for instance, where the chest refills repeatedly after tapping, and it may be a question whether it is of any use in such a case to tap at all. But what I mean is this, that, so far as the tapping is concerned, the operation presents no difficulty and involves but little risk, and therefore, if there is any distress or other untoward symptom, paracentesis may be performed without hesitation. But anticipating somewhat what the cases will subsequently show, I would also say, with regard to serous effusion, that patients with empyema recover after such long periods of compression of the lung, retraction of the chest, and even curvature of the spine, as to make me think that the evils due to such compression have been somewhat exaggerated by those who advocate early paracentesis; and secondly, that the risk attaching to empyema is so great that if, after tapping, a serous effusion shows a tendency to reaccumulate, it had better be let alone, unless urgent symptoms oblige us to interfere. With respect to the adaptability of paracentesis to purulent effusion in the chest, every one will agree that,

as a general rule, when the chest contains pus it had better be let out. The mode, however, by which the evacuation is best effected is still, so far as I can gather, an open question, and varies at any rate within certain limits according as the verdict of personal experience directs the giver of an opinion. If appeal be made to surgery the answer will in all probability be, empyema is simply an abscess and must be treated as such. This implies a good deal—that pus is a very harmful fluid, and that in all cases it is to be removed as speedily as possible; and that the best way to remove pus effectually is by free incision, which alone provides for adequate drainage. Go to some one else and you will probably be told that an opening and counter-opening should be made, and a drainage tube be passed from one to the other. A third advises tapping, the insertion of a flexible tube, and drainage by syphon action. Another, repeated tapping by the aspirator, and so on. But what is the comparative value of the various operations? Take the advocate of any one of them and ask him what risk is run under moderately favorable circumstances, and he will either not be ready to give an answer or will speak favorably of a method which will in all likelihood be condemned by the next person you meet. Or, again, ask any one who has considerable experience of several methods which operation he considers most generally applicable and successful, and again he probably will not give any decided answer. In this condition I find myself. During the last two years I have had under my care from my own out-patients and by the kindness of my colleagues Dr. Baxter and Dr. Frederick Taylor several cases of empyema, and these have been for the most part treated by one plan, viz. that of subaqueous drainage. This operation was, I believe, often used by the late Dr. Hillier, but was brought into prominent notice by Dr. Douglas Powell, and consists in tapping the chest and draining it through the same opening by means of a long india-rubber tube, the open end of which is kept under water. A dynamometer is also attached to one part of the tube by which the intra-thoracic pressure can be tested and also regulated. But the latter addition makes the operation, though possibly more perfect, somewhat troublesome, and Dr. Playfair and Dr. Fagge adopted a more simple modification

in the shape of a simple soft flexible tube, which, when the chest has been tapped, can be pushed through the canula into the chest and the latter withdrawn. This is simplicity itself, and looks at first sight almost perfect. I do not know that even now I am prepared to say that any other way of treating empyema is better, but this I can say that, after treating several cases myself and seeing others treated by my colleagues in the same way, I have formed the opinion that if no treatment can be made to give better results than it, empyema will remain so fatal a disease that the chances for and against the life of the patient or his subsequent usefulness are almost even. Such a result can hardly be satisfactory, nor can we thankfully acquiesce in it, and feeling this I have lately been readopting incision. But this plan of subaqueous drainage has been very largely used of late years, and therefore it is essential that as much should be known about it as possible. There is now material enough at hand to determine its merits, and for this reason I have thought it advisable to collect as many cases of empyema as the records of Guy's Hospital during the last ten years afforded access to, and to these have been added nearly an equal number from the Evelina Hospital for Children, making in all 77 cases. This number will include a fair proportion treated by the method which this paper is chiefly intended to illustrate, but it also affords examples of several others, so that the comparative results of various operations will also to some extent come under notice. It is, moreover, not superfluous to add that, though recorded cases of empyema are plentiful in medical literature, yet for statistical purposes they are too much based upon individual experience, which, however large, seems from published data to run in grooves, or else are single cases, generally successful, which merely beg the questions I now raise, viz. What is the best operation? and what is the risk attaching to even that?

The table which is now subjoined has this important feature: it includes all the cases of empyema which have occurred in the medical wards at Guy's Hospital since 1866, and all at the Evelina since that hospital was opened in 1869. Cases of empyema found on the post-mortem table and not treated as such during life have *not* been added.

Cases not Fatal.

No.	Sex.	Age.	Disease.	Side.	Length of illness before admission.	Operative or other treatment.	Duration of discharge.	Ultimate result.	Physician.	Remarks.
1	F.	5	Empyema	Left	1 month	Spontaneous opening	3 months	Measurement of two sides equal; good vesicular murmur; 5 mos. Free discharge; side retracted	Dr. Habershon	Much green pus expectorated before the abscess pointed
2	M.	21	"	Right	2 years	Ditto	2 years		Dr. Rees	Probable phthisis; the disease commenced with hæmoptysis; liver large; no albuminuria
3	M.	6	"	Left	3 months	Spontaneous pointing; incision	6 weeks	Side much retracted at 4½ mos.; headed 'cure'	Dr. Habershon	—
4	M.	26	"	"	4 weeks	No treatment	None	Heart displaced; pneumonia present	Dr. Fagge	—
5	M.	17	"	"	—	None	None	Slight retraction of chest; bronch. breathing and râles all over	Dr. Wilks	Pus expectorated; secondary abscesses in various parts
6	F.	12	"	"	3 weeks	Paracentesis; this was repeated and a tube inserted; pleural cavity subsequently syringed	3½ mos.	Great deformity of the chest; the lung has much recovered at 4 months—date of leaving the hospital	Dr. Pavy	Left side bulging an inch and a half on admission
7	M.	28	"	"	13 mos.	Simple paracentesis	None	Relief; fluid still in chest	Dr. Moxon	Nine pints of clear fluid drawn off by Mr. Hilton 14 mos. before
8	M.	56	"	"	3 weeks	Incision	3 weeks, very slight at any time	Wound still discharged; chest retracted	Dr. Fagge	Had cough a long time; pneumothorax?

No.	Sex.	Age.	Disease.	Side.	Length of illness before admission.	Operative or other treatment.	Duration of discharge.	Ultimate result.	Physician.	Remarks.
9	M.	26	Empyema	Right	3 days	Subaqueous drainage; the tube became loose and came out; subsequent syringing	7 weeks	Wound still discharging; right chest flattened; air enters fairly	Dr. Fagge	Pus foetid from the first; pleuritis on the other side
10	F.	32	"	Left	16 days	Paracentesis; then subaqueous drainage; subsequent incision, and after that reinsertion of tube, with syringing	A month	Much flattening; no respiration; a quantity of foetid discharge still	Dr. Wilks	After confinement; temporary albuminuria
11	F.	3	"	"	—	Paracentesis; then subaqueous drainage	Not stated	Left the hospital well in 4 months; considerable flattening and bronchial breathing beneath the clavicle	"	Much sweating
12	M.	8	"	"	A month	Subaqueous drainage	5½ mos.	Wound closed; much flattening at 5½ months	Dr. Pavy	The tube was removed when it had been worn 3 months, but chest filled again, and it was reinserted
13	F.	5½	"	"	3 months	Aspirator; incision; syringing	5½ mos.	Tubular breathing along the spine	"	Temporary albuminuria; necrosis of the rib
14	M.	18	"	"	5 days	Incision 3 months after; subsequent counter-opening	3½ mos.	Chest very flat; heart displaced; air enters very badly	Dr. Moxon	Diarrhoea
15	M.	10	"	"	15 weeks	Subaqueous drainage	3 months	Chest filling out; respiration good	Dr. F. Taylor	—
16	F.	12	"	"	10 days	Aspiration; subaqueous drainage; counter-opening in 10th space, with tube between the two	2 months	Chest shrunken; respiration as low as fifth rib	Dr. Moxon	—

17	M.	8	"	"	None	Paracentesis on 18th day; subaqueous drainage on 37th	10 weeks	Perfect recovery. He is still well, 2 years after	Dr. Goodhart and Dr. Price Jones	The chest was excessively flattened at first, and the spine curved, but it rapidly filled out when the discharge ceased
18	M.	5	"	Right	6 weeks	No surgical treatment	No opening	Lung recovering gradually after 7 months	Dr. F. Taylor and Dr. Goodhart	Symptoms: Dulness unilateral, pyrexia, diarrhoea
19	F.	2½	"	Left	A week ?	Ditto	No opening	Lung has recovered perfectly 18 months after	"	Unilateral dulness, bulging
20	F.	Und. 10	"	"	6 weeks	Paracentesis and subsequent subaqueous drainage	3 months	Recovery perfect at 5½ months	Dr. Playfair	—
21	F.	9	"	Right	12 days	Dry tapping; subsequent free discharge from the wound so made	2 months	Dulness; bronchial breathing and crepitation all over	Dr. Powell	—
22	F.	6	"	Left	4 months	Subaqueous drainage	17 days	Left the hospital well 1 month after admission	Dr. Fagge	The temp. never rose above normal in this case; she has lately been among my out-patients, and her chest was quite normal on May 9, 1876
23	M.	5	"	"	8 weeks	Incision under carbolic spray; wound kept open by a tube	2 months	Fair resonance all over; breath sounds fair all over the front of the chest 4 months after admission	"	Hip-joint disease
24	F.	5½	"	Right	2 weeks	Subaqueous drainage	6 months	Wound still discharging; the side rather flattened; respiration bronchial 5 months after admission	Mr. Paley	After scarlatina; the child is wasting
25	F.	6	"	Left	6 weeks	Spontaneous pointing; incision	A month	Much shrinking of chest; respiration feeble, but vesicular, a month after admission	Mr. Howse	—

No.	Sex.	Age.	Disease.	Side.	Length of illness before admission.	Operative or other treatment.	Duration of discharge.	Ultimate result.	Physician.	Remarks.
26	M.	4 $\frac{3}{4}$	Empyema	Left	5 weeks	Free incision under carbolic spray	27 days	Resonance impaired; vesicular murmur all over chest 6 weeks after incision	Dr. Goodhart	Chest filling out; still keeps well
27	M.	2	"	"	5 weeks	Subaqueous drainage; tube removed in 8 days; free discharge after	2 months	Quite well at 3 $\frac{1}{2}$ months	Dr. F. Taylor	—
28	F.	4 $\frac{1}{2}$	"	"	14 days	Subaqueous drainage; subsequent free incision	—	Still under treatment	"	—
29	M.	3	"	Right	7 weeks	Subaqueous drainage; very little pus; tube removed in 14 days	—	Child dying, with extreme distortion of chest; consolidation of right lung and any- loid viscera	"	Has since died
30	F.	4 $\frac{1}{2}$	"	Left	2 years	Spontaneous pointing; incision	6 months	Still profuse discharge, and some evidence of consolidation of lung at upper part	Dr. Hilton Fagge	See Appendix of Cases
31	M.	9	"	Right	14 days	Subaqueous drainage after aspiration; wound closed at about a month; re-accumulation of pus	14 days	Absolute dulness nearly all over; respiration very deficient at base; bronchial at apex; no movement of chest; the wound still discharges, but very little at end of 4 months	Dr. Moxon	Profuse sweating; high temperatures
32	M.	17	"	"	2 months	Incision	10 $\frac{1}{2}$ mos.	Complete dulness; much retraction; vesicular murmur on deep respiration; sinus still discharging	Dr. Pye-Smith	Temporary albuminuria; diarrhoea

No.	Sex.	Age.	Disease.	Side.	Length of illness before admission.	Operative or other treatment.	Duration of discharge.	Ultimate result.	Physician.	Remarks.
43	F.	6	Empyema	Right	6 weeks	Subaqueous drainage near angle of scapula; subsequent incision	1 month	Wound healed at that time. Right chest absolutely dull; vesicular murmur harsh; urine full of albumen	Dr. F. Taylor	See Appendix
<i>Fatal Cases.</i>										
44	M.	21	"	"	3 weeks	No surgical treatment	None	Death 12 days after admission; right lung compressed by a large collection of pus; left pleura inflamed	Dr. Barlow	—
45	F.	16	"	"	2 months	Subaqueous drainage and syringing	5 weeks	Sudden death after syringing	Dr. Wilks	See Path. Soc. Trans., 1875
46	M.	29	"	Left	3 weeks	Subaqueous drainage	5 days	Death from exhaustion and pericarditis	Dr. Moxon	—
47	M.	24	"	Right	4 weeks	Aspiration of serum; subsequent formation of pus; aspiration; incision; syringing	16 days	Death from exhaustion and acute tubercle	"	Pneumothorax occurred after the 2nd aspiration; see Appendix
48	M.	55	"	Left	10 weeks	No surgical treatment	None	Death from exhaustion in 5 days; empyema at base, with carnification; apex in state of old hard induration; middle grey hepatization.	"	Right lung healthy
49	M.	4	"	"	2 days ?	None	None	Death in 3 days; tubercle in the lungs and intestine; peritonitis; pericarditis	Dr. F. Taylor	Extremely emaciated and neglected
50	M.	2	"	Right	5 weeks	Subaqueous drainage; syringing	17 days	Death from suppurative peritonitis	Dr. Pavy	See Appendix

51	F.	30	"	Left	29 days	One simple aspiration	—	Death from exhaustion; the empyema had opened into the lung	Dr. Habershon	Miscarriage of a 5 months' fetus a few days before death
52	M.	28	"	"	2 months	Paracentesis of serum; subsequent subaqueous drainage of the pus; blocking of the tube; syringing cavity	14 days	Death from fever and delirium	Dr. Moxon	Tubercular pleurisy
53	M.	23	"	Right	12 days	Aspiration; free incision; washing out	21 days	Death from facial erysipelas and meningitis	"	The lung collapsed, but quite in a recoverable condition; the chest contained pus
54	M.	23	"	"	6 days	Expectoration of pus	8 months	Death from exhaustion and secondary disease of the lung	Dr. Wilks	See Appendix
55	F.	37	"	"	2 months	No treatment, the symptoms being those of pneumothorax; the urine albuminous	—	Death in 5 weeks; right lung much compressed by pus	Dr. Moxon	Early cirrhosis of liver; tubercular deposit in the peritoneum
56	F.	39	"	"	2 weeks	No signs of any large effusion	—	Death in 25 days; lung closely compressed	Dr. Habershon	Other lung healthy
57	F.	24	"	"	—	Exceedingly ill, without evidence of much fluid; no surgical treatment	—	Death in 11 days; right pleura much thickened and containing pus	Dr. Pavy	Upper part of right lung solid, lower carnified; left lung normal
58	M.	18	"	"	Followed scarlatinal nephritis	Paracentesis twice; subsequent incision	7½ mos.	Cavity large; lung closely bound down, and only one fourth its proper size	Dr. Wilks	Death from diarrhoea
59	M.	24	"	"	Cough for 2 months	Paracentesis 4 times; subsequent free discharge from opening	2 months	—	"	—
60	F.	1	"	"	2 months	Paracentesis thoracis without result	None	Death in 4 days; post-mortem refused	Dr. Goodhart	Complicated pneumonia
61	F.	2½	"	Left	10 weeks	Subaqueous drainage	21 days	Death probably from peritonitis; post-mortem refused	Mr. Howse	—

No.	Sex.	Age.	Disease.	Side.	Length of illness before admission.	Operative or other treatment.	Duration of discharge.	Ultimate result.	Physician.	Remarks.
62	F.	3½	Empyema	Left	—	No surgical treatment	3 months	Death from pyæmia	Dr. Hilton Fagge	Followed pelvic abscess
63	F.	6	"	"	Scarlatina and dropsy 5 wks. ago	Aspirator; 3ss of thick pus	8 days	Left pleura full of thick pus; lung completely compressed	Dr. Playfair	Double pleurisy; right lung partially collapsed
64	F.	1½	"	"	3 weeks	No surgical treatment	—	Death in 4 days; small collections of pure pus and adhesions; much broncho-pneumonia	"	—
65	M.	4	"	"	Scarlatina 3 wks. ago	Subaqueous drainage; blocking of the tube; subsequent removal of it, and syringing of the cavity	—	But few adhesions; the lung crepitant and healthy notwithstanding the empyema	Dr. Hilton Fagge	Scarlatinal nephritis
66	M.	9 mos.	"	"	5 weeks	Subaqueous drainage; imperfect drainage; tube removed	?	In the hospital 13 days only; it appeared to be getting better, and then 3 weeks after died unexpectedly; post-mortem refused	Dr. Goodhart	—
67	F.	6	"	Right	Some months	Subaqueous drainage; sloughing round the tube; deficient exit; counter-opening; syringing	3 months	Right lung closely bound down to spine	Dr. Goodhart and Dr. F. Taylor	—
68	M.	4	"	Left	3 weeks	Subaqueous drainage	—	Child died suddenly next day; old-standing empyema; lungs airless	Dr. Baxter	Double pleurisy
69	M.	4½	"	"	2½ mos.	Subaqueous drainage in 9th space, behind mid-axillary line	—	Death, with symptoms of peritonitis 4 days after operation; post-mortem refused	"	—

70	M.	14 mos.	"	"	10 days	Subaqueous drainage attempted but imperfectly acting; a second tapping necessary	—	Death 6 days after admission; abscess in the lung	"	See Appendix
71	F.	1½	"	"	Ill 3 weeks	Aspiration of serum twice; subsequent incision for pus	6 weeks	Death from wasting and exhaustion	Dr. Goodhart	"
72	M.	4½ mos.	"	"	1 month	No treatment adopted, the child being so ill	—	Death from exhaustion	"	"
73	M.	18	"	"	13 weeks	Free incision	6 weeks	Death from cerebral abscess; perfect recovery of empyema	Dr. Pye-Smith	'Path. Soc. Trans., 1876-7
74	M.	21	"	Right	5 weeks	Paracentesis and drainage by tube; counter-opening next day low down	1 month	Death in a month from ulceration into and suppuration of the lung; no tubercle	Dr. Hilton Fagge	Opening into the lung before he was admitted
75	F.	32	"	Double	4 days	No treatment	—	Death from exhaustion in a month	Dr. Moxon	Purulent effusion in the pericardium also
76	F.	2¾	"	Right	4 months	Subaqueous drainage and subsequent incision in 7th space, as the pus did not run well	A few days	Death from double pleurisy	Dr. F. Taylor	Bronchial glands caseous
77	F.	2½	"	Left	7 weeks	Subaqueous drainage; imperfect drainage; formation of abscess	2½ mos.	Fair respiration; much flattening at the apex; wound still discharging	Dr. Goodhart	See Appendix

These tables convey information on various points which have been often noticed before; but it may be as well to point out one or two of them before proceeding to examine more particularly the relative merits of various operations. For instance, the great preponderance of empyema on the *left* side is manifest. In 50 the left pleura is the one affected. They also show how frequent is empyema in young life as compared with its occurrence in people past middle age. Below is the tabular statement:

	Fatal cases.	Cases not fatal.
10 and under . . .	17	24
20 " . . .	3	9
30 " . . .	9	7
40 " . . .	5	3
	<hr/> 34	<hr/> 43

Of those that proved fatal, 17 were on the left side, 15 on the right, and one double. It has been said that empyema on the right side is more likely to be associated with disease of the lung, and therefore it is attended with more risk to life. The actual facts as obtained from these cases appear to be these: with right empyema tubercular disease of the lung was found twice; a tubercular affection of other viscera, but not of the affected lung, once. Pneumonia occurred four times. Abscess of the lung, probably secondary to the empyema, twice; in all eight cases of lung disease. With left empyema tubercle was present three times, and old induration with grey hepatisation once. One case was probably pyæmic; in all four cases. It might have been supposed that whatever increased risk attached to disease on the right side from the greater frequency of disease of the lung on that side, it would have been counterbalanced by the risk of extension of inflammation to the pericardium, which empyema on the left side would run. It does not appear that this is so, seeing that the percentage of deaths is decidedly larger for disease on the right side. These tables give a mortality of 59 per cent. to right empyema, only 36 per cent. to that on the left side.

As to the mortality at the different periods of life, 41 cases occurred at ten years of age and under, with a mortality of 17, or 41·5 per cent. Twelve were between ten and twenty, with a mortality of 3, giving a percentage of 25. Sixteen

between twenty and thirty, with nine deaths, and a percentage of 56. It is a matter of common observation that children do better with empyema than adults; and these figures confirm that opinion very decidedly if the deaths under twenty be contrasted with those which occur above twenty. Fifty-three is the total of cases attacked under twenty; 20 of these died, or 38 per cent. Above twenty the percentage rises to 58. But some go further than this, and describe the results as more favorable in infants and quite young children than in those of eight, ten, or upwards. My numbers are hardly large enough for me to say much on this point; but as they stand, they point certainly to the greater fatality at very early ages than in later childhood. The percentage of deaths on the whole number of cases is 44; 34 cases died out of a total of 77. This is a higher mortality than Dr. Hughes and Mr. Cock give, 36 per cent., which moreover also corresponds very closely with the result given by M. Legrand de la Liraye (34 per cent.).¹ But it does not appear quite certain, from the wording in the paper by the last-named gentleman, whether his is the result for serous and purulent effusions combined, or for purulent effusions alone. But high as is the mortality which my tables show, it is not in reality high enough, because it does not include several cases which discharged persistently for months or years after the original disease, and which must be said to have been in considerable danger of amyloid disease of the viscera, nor yet those other cases in which chronic lung disease supervened. It was my intention to have placed bad results in one table and good results in another; but looking over the cases, it was evident that many which could hardly be called in a satisfactory state when they left the hospital, disappeared from view before sufficient time had elapsed to enable one to foretell the probable ultimate result. It therefore seemed better to put the deaths in one table and the "not-deaths" in another; as much information as possible has been put into the latter table to enable the reader to form his own conclusions as to what he will call a cure, what an ameliorated, what a bad condition; and for still further details the cases themselves may be referred to at the end of the paper.

¹ 'De la Thoracentèse en Angleterre, Thèse pour le Doctorat en Médecine,' Paris, 1873.

M. Legrand, in discussing the ultimate results, remarks, that of 106 fatal cases death came by way of pulmonary phthisis, tubercular meningitis, or tubercular peritonitis in 50 cases. Our cases give a result nothing like that. Tubercle was found in 6 cases, or about 18 per cent. ; and I believe that one or two of these might with justice be considered as chronic inflammation of the lung set up by the empyema, and thus the percentage still further lessens. It seems to me not at all improbable that such a large number of cases of tubercle as 50 in 106 is due to the fact that these numbers include cases drawn from the Brompton Hospital, and therefore probably include a good number of cases of empyema dependent upon the pneumothorax of phthisis. A few such cases have occurred at Guy's during the last ten years, but they have been omitted from the tables, as they can be of no use to us with regard to treatment, and it would obviously be unfair to class them as fatal cases of empyema. All they could do would be to show that paracentesis thoracis is often of immediate benefit—a point that at this period no one contests. There is no more important question than this of the comparative frequency of old-standing lung disease prior to empyema. If often present, it will sufficiently explain a large percentage of deaths, and we can hope for but little improvement in that direction. At the same time there is no more difficult question certainly if one holds, as I do, that some cases of tuberculosis are distinctly secondary to a chronic inflammation. The cases I have included in the table seem to me mostly to admit of some doubt whether they were primary or secondary tuberculosis, except in one instance, where the tuberculosis was general. But even if these cases are to be considered as originating in a tubercular disease, yet I cannot think that the intractability of empyema is in any large number of instances to be attributed to pre-existing tuberculosis. It will probably be admitted that when empyema is due to tubercle, one of three conditions obtains. The two may be associated in cases of extensive and rapid consolidation of the lung, or they may be found together when pneumothorax has occurred, or in cases of tubercular pleurisy. Now pneumothorax is a comparatively common cause, but all such cases I have excluded for before-mentioned reasons. Of

the frequent occurrence of the other two forms of tubercular empyema there seems to me to be no evidence. Moreover, the clinical history is not to be altogether disregarded, and in a large number of cases this does not show any period of ill health of a lingering kind, but the onset can be definitely fixed, and is that of a sudden inflammatory affection. With children it is perhaps more difficult to obtain the required information, though even with them the parents can frequently fix quite a definite period of seizure, even though, as is often the case, the symptoms have never been of any severity.

Sex.—Forty-six cases were males; 19 of these died, or a percentage of deaths of 41. Thirty-one were females, the mortality with these giving a percentage of 48.

With these few preliminary observations we pass on to the more immediate object of the paper, the examination of the relative advantages of the various methods of treatment of empyema.

Those usually adopted at one time or another have been—

1. The expectant.
2. Aspiration.
3. Paracentesis.
4. Drainage and injection.
5. Subaqueous drainage.
6. Incision $\left\{ \begin{array}{l} 1 \text{ at seat of spontaneous pointing.} \\ 2 \text{ at seat of election.} \end{array} \right.$

The 77 cases are apportioned to the various methods thus :

	Recoveries.	Deaths.	Remarks.
1. Expectant treatment	4 ...	11	
2. Simple aspiration .	0 ...	2 ...	The aspirator has been used in many cases, but some further treatment has in all the other cases been resorted to.
3. Paracentesis . . .	3 ...	2	
4. Drainage and injection	1 ...	0 ...	
5. Subaqueous drainage	18 ...	13	By paracentesis and leaving the canula in the wound.
6. Spontaneous pointing	11 ...	0	
7. Incision at seat of election . . .	6 ...	6	
	<hr/> 43	<hr/> 34 ...	Total 77.

This analysis is not strictly correct. It will be seen by looking at the tables that in many cases two or more of the operations enumerated were employed during the course of the disease. Some cases of subaqueous drainage, for instance, were incised; others syringed. Some cases of incision had the aspirator applied once or twice before the knife; others were tapped first and incised afterwards. The numbers given are obtained by taking the main treatment adopted in each case; the minor details can be referred to in the tables or at the end of the paper.

Of the *expectant treatment* it may be said that, almost as long as the existence of pus in the pleural cavity has been recognised, has the opinion been held that an empyema may sometimes be safely let alone.

Dr. Hughes,¹ after referring to the publication of cases which confirm this, by Stokes, Hope, and others, says, "Many such cures I have myself seen; several such cures I have myself effected." Both West and Hillier advocate the same expectancy. The latter² puts the case thus:—"When pus exists, as a general rule the sooner paracentesis is performed the better, but if the empyema be of very long standing, and the dyspnoea not great, it is better to leave the case to nature."

I am quite disposed to coincide with this view, and I have notes before me of several cases where I believe pus to have been present in the chest and where the physical signs have gradually subsided under attention to the general health of the patient. Moreover, it is by no means so very uncommon to find an old and localised empyema *post-mortem*, and in both these classes of cases, if the pus is ever brought to view, it is found quite thick, sometimes caseous, and more rarely is only represented by a calcareous plate; indicating quite positively that absorption has begun, and in the latter case that it is well nigh completed. But it is I think very doubtful whether a general purulent effusion occupying the whole of the pleural cavity ever resolves itself without removal of the pus either spontaneously or otherwise; those cases in which an expectant treatment suffices are in all probability rather local abscesses in some parts of the pleura, which sometimes indeed attain a

¹ Loc. cit.

² 'British Medical Journal,' 1867, vol. ii, p. 80.

large size by the stretching of their walls, but which still remain local abscesses and are not diffused inflammations localising themselves. The symptoms which are most reliable for the detection of such cases are nocturnal pyrexia, diarrhœa, sometimes sweating, with signs of fluid at the base of the lung. The following case is one of several which might be given as instances.

A boy of 5 years old came to my out-patients at the Evelina Hospital, on August 10th, 1875. His mother stated that he had been quite well till six or seven weeks before, but since then he had had bronchitis and what she called "slow intermittent fever." He had gradually wasted, his breath becoming short, and he had slight hæmoptysis. The right side of his chest gave a remarkably tympanitic note at the apex both back and front, but below the level of the spine of the scapula dulness existed everywhere; tactile vibration was diminished, but not vocal resonance. A little fine crepitation was heard at the apex, but elsewhere the respiration was very deficient. The heart was not displaced nor the chest retracted. I was at first undecided whether the child had phthisis or whether all the signs were due to fluid at the right base, but gradually the respiration became more bronchial under the clavicle, and the dulness extended from the base to the apex. At the end of two months the right side was noted to be dull all over and the side bulging, and the intercostal spaces filled out. He moved that side very little.

He was now admitted for more close observation under my colleague Dr. Taylor, and from his note-book the following record has been taken. Up to December 17th frequent observations were made both of high temperature and also diarrhœa. On the latter date the evening temperature was still decidedly high, and it is said that the lung appeared to be breaking up from old pleurisy. The temperature fell in January, though still keeping at 99° to 100°. He improved in general health, becoming stronger, and his weight not decreasing. He was discharged at the end of six months; when he left, the state of the chest was as follows:

Imperfect resonance in front on the right side with a boxy note over the fourth and fifth ribs. Behind, there is absolute dulness up to the middle of the scapula, above this it is less.

Respiration is feeble in front, with some few moist sounds, and the expiratory murmur is prolonged. The vesicular murmur is very feeble behind, especially towards the base.

There can be very little doubt, I think, that this child had empyema. It is of course possible that he had phthisis with some little fluid at the base of the lung, and not empyema alone, but though the physical signs were not at all out of harmony with that supposition, still they were no more marked than has frequently been the case in empyema, where destructive disease of the lung has been shown not to be present. It has been said many times before now that empyema in children may very easily be mistaken for phthisis, and what is more it often is so mistaken : Dr. Hughes in the paper before referred to makes mention of such cases, and Dr. Hillier also.¹

The figures given above do not help us much in deciding that cases may be left to nature, or what is the risk thereby run, for it is very evident that the 15 cases, 4 recoveries and 11 deaths, under the head of expectant treatment, include quite distinct groups. Of the 4 which recovered, two were by no means acute cases, and were just such as one might have expected to do well. The 11 fatal cases on the other hand include 5 of acute general empyema ; 2 of lung disease in addition, one of tuberculosis, and one of pyæmia. Only one, indeed, remains to compare with the others. Its history will be found given shortly in the appended cases (No. 54). The patient, a young man, was admitted for pneumonia, and empyema followed this. His chief symptom was copious expectoration of pus, and he sank exhausted with secondary disease of the lung. This case and that of the boy already given illustrate very well the risk that is run by leaving pus in the chest. The lung tissue is in considerable danger of undergoing secondary inflammatory changes, and though it may be that the risk of septic suppuration in the chest after operation is greater, and therefore disposes us to avoid it if possible, it cannot be said that any summary of the possibilities incurred by leaving cases to nature leans towards a very hopeful prognosis. Other cases also are to be found in the tables which show that the same risks which attach to

¹ Loc. cit.

pent-up pus in other regions are of paramount importance here. Moreover, it is quite possible that by excluding all the cases of empyema associated with pneumothorax, in which the latter appears to be primary, we may be really excluding some which *produced* the pneumothorax, and be thus unwittingly placing even this anything but favorable verdict in a somewhat less repellant aspect than belongs to it.

With regard to *simple aspiration* as a means of *curing* empyema I have seen it used now many times, but never with any other success than that of immediate and temporary relief. It has been used eight times according to the tables. Three of the cases ultimately did well, but in one incision was practised afterwards, in another counter-opening and drainage, and in the third syphon drainage and incision. Five cases died; three of these were incised subsequent to the aspiration; in two death occurred before any other procedure had been adopted; in one (51) partly due, no doubt, to a premature confinement, in the other (63) to double pleurisy. It is important to add that of the five deaths two were cases of serous effusion only when first aspirated, but they subsequently became purulent. Aspiration is exceedingly useful in some cases as a means of temporary relief, and in all cases for mere purposes of exploration, and, for my own part, to these two classes of cases I should be inclined to limit its use, but one cannot ignore the fact that others have obtained permanent cures by means of it, and notably Dr. Bowditch, of Boston. Aspiration is by no means so simple or so harmless, however, as some of its advocates would have us imagine; at least this is so in its application to children, for the pus in empyema in children is often very curdy or thick and will not run; at other times, and this has happened even when the fluid has been thin and serous, the exhausted bottle has exercised so much suction upon the lung that large quantities of air have been sucked from the lung into the bottle with the pus. My friend Mr. Paley, the house surgeon at the Evelina Hospital, has had very considerable experience in the use of the aspirator, and he tells me that such an occurrence is not at all uncommon, and we have both observed it in cases where the various joints of the instrument were in perfect working order, and where one could adopt no other conclusion than

that the air must have come from the lung. In one of the cases of serous effusion becoming purulent it seems not unlikely that this suction of air may have determined the purulent change in the fluid. When aspiration is performed the trocar and canula should always be in one, and the former capable of retraction within the latter. The pointed canula in ordinary use is, I think, a dangerous instrument for exhausting the chest, and makes the risk of a wound of the lung considerable. This complication is to be avoided for several reasons: 1st, it leads to the escape of a little blood into the pleura, which facilitates decomposition of the pus; 2ndly, it will admit of the escape of air into the pleura; and lastly, it opens a way for the burrowing of pus into the lung tissue, a mode of exit which, though it may and does sometimes lead to spontaneous cure, does so at considerable risk to the subsequent integrity of the lung itself.

For purposes of exploration it is quite unnecessary to use all the paraphernalia attaching to a Dieulafoy's aspirator. An ordinary subcutaneous injection syringe fitted with a rather long steel needle tube of fine bore is in use at the Evelina Hospital, and it answers admirably.

Simple paracentesis was practised in 11 cases. In 7 the subsequent introduction of a tube became necessary; in 1 incision; in another a permanent fistula formed, and one left the hospital with fluid still in the pleural cavity. Of the 11 cases 4 died; one of tuberculosis, one of diarrhœa (lardaceous intestine?), one of pneumonia, and the cause of death in one is not stated.

Here, again, is an operation by means of which some cures have been recorded. It is that which Dr. Hughes and Mr. Cock advocated in their paper, and the facts which have just been stated bear out thoroughly their statements, viz. that paracentesis in empyema is a means of relief, and since it assuredly relieves it may be said to be successful. I am not now discussing relief but cure, and consequently all that I can say in favour of paracentesis is that cures have been recorded, but that the cases tabulated here do not contain any such, and I should never adopt the operation with that hope only in mind. But in another way I believe that paracentesis is sometimes a useful operation. It as it were coaxes the pus

to point spontaneously. Cases which do thus point without interference seem to run less risk of death than others where surgical interference is necessary, and a reference to the tables will show this. Eleven cases are recorded of spontaneous opening and no death. It is true that in only one case was a cure effected; in all the others a permanent fistula resulted or some decided evidence of chronic lung disease. Still, on the whole, such a termination must be considered better, bad as it is, than death. The doctor certainly must call it better; the patient, perhaps, might be less decided on the point.

It is not very easy to say why cases which point of their own accord are less fatal than others. I am inclined to believe that their being so is solely dependent upon the mode of exit of the pus which, in these cases, finds its way out by a more sinuous channel, and yet generally with considerable freedom. The pus is not often offensive under such conditions, and therefore I believe that the external air is thoroughly excluded from the pleural cavity. In most cases treated surgically the pus becomes offensive sooner or later, and in so doing adds immensely to the risk. Now, after the aspirator has been used, it is very common to find the pus burrowing towards the surface, sometimes in the neighbourhood of the puncture, and this is easily explained; as I said before with regard to puncture of the lung by the trocar point, a passage is thus made along which leucocytes can wander and set up suppuration; and it is also not unlikely that, in the withdrawal of the needle, a few pus-cells are left behind in its track, which may excite a local inflammation and weaken the chest-wall at that spot, and so lead to pointing. It can be easily seen that, if this is so, the opening made into the chest would be probably much less direct than that of the surgeon; that, in fact, just the same condition would be present as that which is liable to occur naturally. Indeed, I am not at all sure, and I mean to test this should an opportunity present itself, that it would not be a good plan to perform acupuncture of the chest-wall in several places with a view to getting free exit of the pus by what may be called the natural efforts of the tissues.

We come now to the three modes of treatment which are

more radical in their aim : subaqueous drainage, incision, and drainage without any precautions for the exclusion of air, either with or without the injection of various disinfectant solutions. These all have the same ends in view, viz. 1st. The complete evacuation of all the pus in the pleural cavity. 2nd. Constant and complete drainage. I do not believe that any one of them accomplishes what it professes to do ; and in proportion to the extent of its failure, so is each operation dangerous to the patient. It should be laid down as an ideal which must be attained to that, if drainage is decided upon in empyema, nothing short of perfect drainage is safe for the patient. The several operations now under discussion have all been proposed as having claims to consideration because they drain well, but a reference to the tables will soon show how miserably they are liable to fall short of their promised performance.

I will take what I have called *subaqueous drainage* first, because owing to the fact that the rationale of its operation is rather attractive, and that it is less severe-looking in its performance, it perhaps more than the others leads to disappointment when it comes to be tested. I may perhaps remind the reader that the operation is carried out in the following manner :—Having determined on the spot at which puncture of the chest is to be made, a trocar and canula are taken, the bore of which is about five millimètres. A length of several feet of black or red india-rubber tubing, which will slip easily through the canula, is placed ready to hand ; the chest is then tapped and the trocar withdrawn ; and as the fluid issues in full stream by the canula, the india-rubber tubing is pushed along the latter into the chest as far as necessary, usually four or five inches. The canula is then withdrawn over the tube, leaving the one end of the latter in the chest, while the other or free end is kept under water by the side of the bed. The tube then acts as a syphon, of which the short arm is in the chest, the long arm outside.

Before saying anything as to its advantages and disadvantages, I give a summary of all the cases in the tables treated in this way, with their index numbers attached for facility of reference.

Cases not fatal.

Index No.

6. Syringing necessary.
9. Tube became loose and came out. Syringing necessary.
10. Incision necessary afterwards. This also failed to empty chest.
11. Appears to have answered well.
12. Operation answered very well.
15. Do. do.
16. Counter-opening necessary afterwards.
17. Operation answered very well for some time. Then the tube became blocked and an abscess formed spontaneously.
20. Operation answered very well.
22. Do. do.
24. Wound still discharged six months after.
27. Tube removed in eight days; free discharge after.
28. Subsequent free incision necessary.
29. Very little pus came away. The child is now dying of amyloid viscera, &c.
31. Imperfect drainage; formation of an abscess.
33. Do. do.
42. Answered perfectly.
43. Incisions made.

Fatal Cases.

Index No.

45. Sudden death after syringing.
46. Pericarditis. Operation appears to have answered well for five days.
50. Syringing necessary. Suppurative peritonitis.
52. Tube blocked. Syringing necessary.
61. Peritonitis probable. Pyrexia before death, and the discharge from tube ceased, so the tube was removed.
65. Blocking of the tube; imperfect drainage. Syringing necessary.
66. Tube removed for imperfect drainage.
67. Sloughing round the tube; deficient exit of pus. Counter-opening and syringing.
68. Double pleurisy. Death the day after operation from the pleurisy.
69. Death from peritonitis. Operation performed low down; ninth space.
70. Pus very thick and would not flow.
76. Subsequent incision, as the pus did not run well.
77. Imperfect drainage; formation of an abscess. Death from exhaustion.

Analysing these facts still further we get this result.

7 cases were drained thoroughly.

- 18 „ failed more or less, as far as the tube was concerned, for imperfect drainage resulted.
- 2 „ had permanent fistulæ.

1 case is now dying from chronic lung disease.¹

1 „ is doubtful. Incisions were made, but why so, is not stated in the report.

2 cases died shortly from complications.

The eighteen cases of imperfect drainage include several which ultimately did well, but, as far as can be seen, no thanks to the method of subaqueous drainage.

Death occurred three times from peritonitis, once from pericarditis, three times from pleurisy, once suddenly after syringing. The other five cases from the usual fever, exhaustion, &c.

The figures stand thus :

Deaths	13
Cures	12
Fistula remaining	4
Dying of chronic lung disease	1
Under treatment	1
	<hr/>
	31

Out of a total, then, of 31 cases 13 died. But of these, three cases may be subtracted as not dependent upon the operation directly nor indirectly because of its failure to cure the disease. This leaves a mortality of ten in a total of 28, or 35·7 per cent.

Now, it will be seen that this death rate is not higher than that given by others, as the rate for all cases taken together, and perhaps it may justly be said that this mortality represents about the average number of deaths which must be expected under any treatment from suppuration in a cavity such as that of the pleura. It may be that this is so. But even then it will be allowed that this is a treatment which professes to drain away the pus. In a large number of cases it does not do so, and therefore it may reasonably be hoped, if any other method can be found to work more effectually or if this can be made more perfect, that the results will be more favorable. The question is, Can complete drainage be effected by any means without running undue risks in some other direction? For my part, at present, I feel hardly disposed to answer this.

The reasons of its failure in effecting the desired object are,

¹ This patient has since died.

I think, not far to seek, and they are moreover not easy to overcome by this or any other method. One is, that the pus is very often thick and curdy; the other, that adhesions are liable to form and make the single cavity multilocular. It may be granted, I think, that if these two conditions are absent the syphon plan ought to succeed. Unfortunately, however, from the very nature of the cavity in which the supuration occurs, the formation of pus cannot in the majority of cases be expected to cease quickly, consequently the tube must be kept within the chest for a long time; adhesions then form and shut off one part of the pleura from another; one part is drained and the others not; the discharge from the tube ceases, and it is withdrawn; the wound heals, and subsequently pus makes its way again externally either by the reopening of the sinus or by a fresh channel.

The presence or absence of adhesions make, probably, just the difference of success or failure in the tube treatment. As I have just stated the case, I have attributed the formation of adhesions to the presence of the tube, and it ought in justice to be said that the more perfectly it acts the more likely adhesions are to form. Within a very short time after the removal of the fluid by its means the chest will usually become much less dull and the respiratory murmur again quite audible. At the same time there is far from complete expansion of the lung, and consequently the affected side is within a very short time considerably flattened. Between the two conditions of expansion of the lung and flattening of the chest the empyema cavity becomes much diminished; the space at the base of the lung between it, the diaphragm, and the front wall of the chest in the neighbourhood of the pericardium becomes contracted, and sometimes the part between the lung and the wall of the chest low down also. This cavity is liable to still further encroachment by granulation tissue growing into it from the surface of the parietal pleura—I have measured this more than half an inch thick—and also by being partially filled up by coagula of lymph, which are sometimes, especially in children, in large quantity. All these things taken together, it is, I feel sure, by no means uncommon for adhesions to form after the tube has been introduced and the chest drained, and when they do, unless, as in rare cases does happen, they obliterate a good part

of the cavity and become well organised, they are liable to render the treatment futile. The lymph softens within the adhesions and pus collects, gradually stretching the newly formed wall till it either bursts into the old cavity, perhaps still being drained by the tube, or makes its way out by a fresh opening. It need not be, perhaps it is not often, that the adhesions form *after* the tapping; in some cases no doubt the pleurisy is originally of a plastic form, and the two layers of pleura become adherent here and there, and pus forms afterwards from one cause or another. Such a condition would be equally unfavorable to the success of the tube, but the tube itself would of course not be primarily in fault; and a similar condition is liable to occur in a partially adherent pleura of old date; an adherent pericardium by no means renders a patient safe from another attack of acute pericarditis, nor does an adherent pleura save from recurrent pleuritis.

There is a further disadvantage in the syphon drainage, which has not, I think, received sufficient attention, and that is the suction action of the tube upon the lung when it has drained the pleura empty. This must surely have a great tendency to produce an aperture in the lung opposite the orifice of the tube, and so lead to pneumothorax and to the evacuation of part of the contents of the pleura by the bronchial tubes, a termination by all means to be avoided. It is difficult to obtain direct evidence of the risk run in this direction, because the pus itself has a tendency to burrow into the lung, and old empyemas often show ulcers in the visceral pleura; but patients have been noticed to complain of pain of dragging character, and sometimes apparently severe, when the bottle containing the end of the tube has been at a much lower level than the chest, and in one case it was most difficult to adjust the apparatus because of this pain. Such cases give evidence of the force of the suction. On the other hand, this method has great advantages which cannot be disputed; it is simple in its performance; there is no need of cutting, and the softness of the rubber is often so well tolerated by the skin and tissues, that hardly any inflammation takes place around it, the skin fits round it accurately, and under the favorable conditions noticed previously, pus can be drained from the chest for weeks without any decomposition.

I have kept a tube in the chest for six weeks without the least evidence of any admission of air into the chest. It is not by any means always so; sloughing takes place round the tube occasionally, and caries or necrosis of the rib have been noticed twice or three times; but the sloughing has been due, I think, perhaps to the use of too large a trocar, and to injury to the skin in the operation, and not to the presence of the tube itself. Necrosis of the rib, moreover, may occur when no tube has been used at all.

Then, too, the syphon plan is admirable for washing out the chest. My impression is that, where possible, all such interference with the cavity had better be avoided; but where it is really necessary from much decomposition within, no plan answers so well as this by the syphon plan. By the usual methods as much air gets in as fluid; by carefully replenishing the bottle in which the tube lies, the whole operation can be conducted without the admission of any air, and both quietly and painlessly, almost, indeed, without the knowledge of the patient—a great advantage when excitable children are concerned. Indeed, fluid runs into the chest so easily in this way that it is well to warn the nurse not to raise the bottle incautiously at any time. A case occurred to me some time ago which well illustrates this necessity. The bottle had been raised because of pain which the child complained of, and it contained a rather stronger solution of carbolic acid than the usual lotion. In a very few minutes it was nearly empty, when fortunately its condition was perceived; the bottle was depressed again at once and the action reversed, and no harm came, except that the next urine that the child passed was, though not black, of a very black-brown, indicating that some of the acid had been absorbed.

We pass on to the treatment by *incision*. This also is a plan which can have no other object than the complete drainage of the chest. Now, it is hardly worth while to remark, that if we want to drain a cistern, it is of very little use to make the hole at the high-water line. Nevertheless, in considering the results of the treatment of empyema by incision, it is necessary to bear this in mind. A number of chests have been incised for empyema subsequent to the failure of other modes of drainage, or the spontaneous exit of the pus,

and in nearly all, if not all these, the opening has been made in the site of the previous operation, or over the spot where the abscess has formed. In either case this hardly ever happens to be the bottom of the chest; it is usually near the nipple, or somewhere in front of the lower angle of the scapula. This is, of course, a very different thing from making an opening at the lower part, and I am inclined to think it would be better in cases where the pus is coming forward spontaneously, rather than this, not to interfere at all, but to leave them to natural processes. In the case of some previous ineffectual operation the subsequent incision often relieves because the larger opening is better than the smaller. But apart from this, they are hardly to be counted as cases of empyema treated by incision, because they cannot fulfil the conditions required of any sound plan of interference, viz. complete evacuation of the pus. But let us examine the results as they stand. Subjoined is a table, similar to that drawn out for subaqueous drainage, of the cases in which incision has been practised, whether primarily or secondarily.

Cases not fatal.

Index No.

3. Incision after spontaneous pointing. Cure.
8. Incision; chest retracted; wound discharging.
10. Paracentesis; subaqueous drainage; incision; all seem to have failed to drain the chest, and subsequently the tube was reinserted and the cavity syringed.
13. Aspiration; incision; syringing. Respiration tubular near spine; necrosis of rib.
14. Incision; subsequent counter-opening. Condition of the lung bad.
16. Aspiration; subaqueous drainage; counter-opening; shrunk chest.
23. Incision under carbolic spray; wound kept open by a tube. Cure?
25. Spontaneous pointing; incision. Cure?
26. Free incision under carbolic spray. Well.
28. Subaqueous drainage; incision. Well.
30. Spontaneous pointing; incision; wound still discharging, and evidence of consolidation of lung at apex.
32. Incision; sinus discharging months afterwards; chest much retracted and quite dull.
36. Incision after paracentesis; chronic disease of lung and morbus Brightii.
40. Rib incised many months after spontaneous opening; amyloid viscera.
41. Incision; counter-opening; through-drainage; fistula.
43. Subaqueous drainage; incision. Well.

Fatal Cases.

Index No.

47. Aspiration of serum twice; subsequent incision for pus; pneumothorax after second aspiration; tuberculosis.
53. Aspiration; free incision. Death from facial erysipelas and meningitis.
58. Paracentesis twice; subsequent incision. Death from diarrhœa.
67. Subaqueous drainage; counter-opening; exhaustion.
71. Aspiration of serum twice; subsequent incision for pus. Death from exhaustion. The incision did not drain the chest well.
73. Free incision; perfect recovery from the empyema. Death from cerebral abscess.
74. Paracentesis; counter-opening; abscess of the lung.
76. Subaqueous drainage; subsequent incision in seventh space. Death from double pleurisy and caseous bronchial glands.

Analysing these we find :

Recoveries	7
Fistula remaining	6
Chronic lung disease, &c.	3
Deaths	8
	<hr/>
	24

Taking the recoveries as 16, and the deaths as 8, we get a percentage of 33·3 in the death rate, but this ought to be lessened to 29; for one of the fatal cases was shown by a post-mortem examination to be perfectly well of the empyema, but in the process of cure he had contracted an abscess in the brain, which proved fatal. There is, however, this to be said, that it is probable that the abscess would not have occurred if an incision had not been made, for one cannot but suppose that it originated in the febrile or septic state which ensued upon the opening of the chest.¹ The cases which have been incised at once without any other previous treatment except an exploratory puncture or paracentesis, show 7 recoveries and 5 deaths; or, if the already mentioned death from abscess of the brain be counted as a cure, 8 recoveries and 4 deaths. Taking this the more favorable enumeration, we still get a mortality of 33 per cent.—a result not much more favorable than that with the syphon drainage.

One is hardly prepared for such a result as this, and I

¹ See 'Path. Soc. Trans.,' 1876-7, Dr. Pye-Smith's case. It is well known that pyæmia very rarely follows an abscess which is kept quite free from the contamination to which contact with the atmosphere leads, but this rule is not, I think, so constant for empyema as for other collections of pus more completely away from the process of aëration, as in the subcutaneous connective tissue or elsewhere.

may say at once that, notwithstanding the figures, I believe that incision is by far the better mode of treatment. It seems to me more likely to accomplish the end in view than subaqueous drainage; but, as far as these cases go, it does not show any great improvement. The reason of this is, I believe, that care is not taken to get the opening as low in the chest as possible; and, moreover, one is apt to assume that when an incision has been made, the opening must be quite free. I find mention of the chest being incised in all sorts of places, whereas it is important to make it in all cases at one spot; that is, in the *ninth* space at the angle of the rib or just in front of it. In the *lateral* region of the thorax an opening may be made as low as the *seventh* space: midway between this part and the angle of the rib in the *eighth*, and at the angle in the ninth. To go lower than this limit at either of the three places is dangerous, and I have seen death result twice at least, if not three times, from suppurative peritonitis, I believe from too little attention to this rule. To go above this is to leave a space below which cannot be drained; and to go behind the angle endangers the lung, which is usually bound down to the posterior wall of the thorax near the spine. 2ndly. It by no means follows, because the chest has been incised, that the pus will find its way out freely enough by the larger opening, and I do not think enough precaution has been taken to ensure that it should do so. Has the reader ever put his finger into the chest when it has been incised to see how close the ribs come together? this is so in adults, but in children there is really very little room indeed; and when the chest flattens in, as it does very quickly after the removal of some of the fluid, the ribs are so close to each other that there may be a good-looking aperture outside and really none at all within; and yet when a probe is passed in, it of course appears that there is a free passage and plenty of room. I can well illustrate this from one of my own cases (Case 69), the last, indeed, that has been under treatment. A little girl, $1\frac{1}{2}$ year old, was admitted under my care into the Evelina Hospital, when taking the beds for my colleague, Dr. Baxter, this last autumn. There was considerable distress, and it was necessary to remove some of the fluid. This was done by the aspirator, and the child was much relieved. The

fluid was serous. It re-accumulated, and again the aspirator was employed, and a third time also, but by that time pus had formed. Mr. Paley, therefore, incised the chest for me, low down posteriorly, and the child took its food well and improved for three or four weeks. Then it began to lose the little ground it had gained, and to make a long story short, it died. The discharge of pus had been very little for some time before its death, but the opening seemed quite free and the temperature was low. When the post-mortem was made the chest contained some ounces of pus—was indeed about one third full, and no other disease was found except the empyema and a collapsed lung.

Then, again, the opening may be free enough, and yet the pus will not escape from a single aperture, because of the inequality of pressure within and outside the sac. It is common enough to find that pus exudes but very slowly till the patient coughs, when out it comes in a full stream; this tells the same tale. It is extruded by forcible compression of the chest wall, and is not flowing out as it forms. It was, I suppose, to overcome this difficulty that the original drainage plan was adopted, that of an opening and counter-opening, a tube being passed into the chest at one point, and out again at another. This is still looked upon by many as a good method of treatment, and it is I believe from what I have seen a really effective mode of drainage. Our records give no numerical result sufficient to say much upon its value. It has only been practised five times; three of the patients recovered and two died. But I would rather do away if possible with the necessity of having a tube in the chest for a long time, which is an essential feature of this plan; and I believe quite as complete a drainage may be effected by a free incision made antiseptically and a short drainage tube. The former should be low down and at the angle of the ribs, and large enough to admit the tube, and yet leave plenty of room for pus to make its way by the side. I would have the drainage tube made of vulcanised rubber, as are the tubes now in use, sufficiently tough to resist the pressure of the ribs between which it lies, and only long enough to go just within the pleural cavity. One of Mr. Morratt Baker's short drainage tubes, which have a thick and flat plate of rubber at the external orifice, could be easily fixed,

and would, I think, answer all purposes. I can easily conceive, however, that in some cases, especially in children, it may be necessary to saw across one of the ribs, or even to take a piece of the bone away to secure a free-enough exit for the pus. Mr. Bryant adopted the former procedure, that of sawing the rib across in a case of old empyema under Dr. Wilks's care last year, with the result of considerably facilitating the exit of pus. More recently Peitavy has recorded two cases of resection of a portion of the rib.¹

This, then, is what I believe to be the best mode of treating empyema. No one will be so sanguine as to hope that with an abscess sac such as this, which is kept open by the unyielding material of its walls, that any mode of treatment will cure in all cases, and there must be, probably always is, a large number of deaths amongst those attacked. But that the death rate may be reduced I do believe, and hope to see in whatever future experience I may have. I have before made mention of the somewhat more favorable results obtained in children than in adults; and it is perhaps here the proper place to mention, since I should not wish to be supposed ignorant of the fact, that Dr. Bowditch, of Boston, asserts that nearly all children with empyema recover after thoracentesis. He appears to use the aspirator as often as necessary in any one case, and only draws off a small quantity of fluid at a time. I have no wish even had I the right to criticise this statement, but I must say that I do not think so favorable a result will ever be found even in children in England. Putting aside the special case of empyema, and taking that of acute or chronic abscesses, which is, in fact, taking a case most favorable for success if the operation is to succeed, what is the experience of English surgeons with regard to the usefulness of the aspirator in the case of an abscess? It is used once and perhaps repeated, and finally the sac is laid open. Quite exceptionally a cure results; can any better termination be expected where the conditions are less favorable, and they are less favorable in empyema? Dr. Bowditch insists much on the fact that, after performing thoracentesis in over 200 cases, none of his patients have died immediately or in consequence

¹ 'Berliner Klinische Wochenschrift,' May, 1876; 'Lond. Med. Record,' Aug., 1876.

of the operation, and he attributes the large number of deaths after the operation in Europe to our doing too much. I was not aware that any large number of deaths did occur immediately after the operation; they are decidedly rare in any one man's individual experience, just as are deaths from chloroform; but take all the cases recorded, and they certainly mount up to a goodly number. But there can be no doubt that Dr. Bowditch is right in insisting on meddlesomeness as a cause of some fatal cases. Some of the sudden deaths after washing out the chest may be attributed to this procedure, and besides one such case in the 77 in the table, two or three other patients had rather urgent symptoms of breathlessness and thoracic distress during or just after the operation, not, however, fatal. And with regard to incision for empyema, if, as I think, thoracentesis alone is not sufficient to effect a cure, and some major operation is necessary, then we must, while taking all possible precautions to avoid it, yet be prepared now and then for a fatal termination to the operation, for it can hardly be otherwise than that the intra-thoracic tension must be rather seriously disturbed, and the circulation, which had become accommodated to its altered circumstances, be thrown out of smooth play till time allows of its readaptation.¹

If I had thought it worth while to display the *immediate* results of thoracentesis even for empyema, the table would, as I have said before, be extremely favorable to the operation, but does any one require to be told this? It is, on the other hand, very necessary to raise the question of the ultimate issue of cases of empyema, if some cure all their patients, and others lose thirty or forty per cent.

A suddenly fatal result after one or other of the various operations would appear to come about from two causes, or rather cases dying suddenly may be divided into two classes.

¹ Since writing this my attention has been called to the 'Charité Annalen,' 1874 (Berlin, 1876), and a paper therein by Dr. C. A. Ewald, "Zur operativen Behandlung pleuritischer Exsudate." The collected cases of empyema are less numerous, being only forty-six; the death-rate on the total number, whether treated by incision or puncture, amounts to 55.17. Several of the conclusions arrived at by Dr. Ewald are much the same as my own, the chief of which is that incision is the best mode of treatment. With regard to puncture his mortality reaches 75 per cent., a more unfavorable result than by medicinal treatment alone.

There are those who pretty certainly die from the disturbance to the circulation and an œdematous or congested state of the opposite lung, that is to say, from suffocation; and there are others who are suddenly seized with either epileptiform convulsions or coma, and die without returning again to consciousness. That deaths should happen from the first-mentioned cause is not to be wondered at, and to explain their occurrence is not difficult, but it is quite otherwise with regard to the second group. They have not unfrequently been progressing favorably for some time, and then, after some trifling disturbance, such as syringing the chest, to which, may be, they have been previously and daily well accustomed, they fall back comatose and die. Two suggestions have been made to explain such an occurrence—one that it is brought about by embolism of some parts of the encephalon—medulla or pons; the other that it is some profound disturbance of the central nervous system by the peripheral irritation of the pleura or large branches of nerves in the neighbourhood. Neither hypothesis is without serious flaws, and at present all that can be said is that we do not know why such cases occur. The single case recorded in the table was published in the 'Pathological Society's Transactions' last year, because I thought there was evidence that emboli were being detached from some part and carried about, the grounds for this opinion being the existence of certain ecchymotic spots in the substance of the heart resembling the extravasations which are known to result from the plugging of vessels: but no plugs were found. Since then another case has occurred, which seems to point to the detachment of minute emboli during the course of empyema. I allude to the case of the patient of Dr. Pye-Smith, who died of cerebral abscess. Granting, of course, that there is not as yet sufficient proof, it will be allowed, I think, that it is not unlikely that in the compressed lung, clots may form in the smaller branches of the pulmonary vein and elsewhere, and becoming dislodged from thence be thrown broadcast over the body. They would mostly be too minute to leave any traces in the solid viscera, but they might easily be large enough to produce fatal results if they plugged small vessels about the medulla or pons Varolii. I am bound, however, to add, that a microscopical examination of lung tissue carnified by a long-

standing empyema or fluid, has not as yet given me any decided evidence of ante-mortem clotting in the vessels.

This is hardly the place to discuss the changes in the lung which follow upon chronic pleurisy and compression, for this would be to open up the whole question of fibroid changes in the lungs, a subject that would at least double the length of this paper, and is, moreover, quite worthy of separate treatment. I shall content myself by saying that, where the empyema has existed for some weeks, marked changes will always be found in the lung as well as on the surface, and that they are essentially the same as are found in interstitial pneumonia. The fibrous septa are much increased in thickness, crowded with nuclear elements, and the coats of the bronchi and pulmonary vessels are thickened. The pleura is of course thickened, extremely vascular, and vessels and fibrous bands run directly from the new material into the lung, and from the lung into the material on the surface ; but the changes, so far as I have seen at a few weeks' date, are not extreme, and do not, I think, simply on this account warrant unduly early surgical interference with a view to their avoidance.¹

In concluding I would allude in a word to one or two points of practical importance if it comes to be a question whether an operation should be performed or not, and which are not insisted upon in standard works.

First of these I would note that *emaciation* is often extreme in young children who have empyema. A child a few months old came within the last year among my out-patients with a moderate quantity of fluid in its left chest ; it was not extreme in quantity, but the child was very ill, and it was wasted to the last degree. I hesitated to tap it, and Dr. Taylor kindly saw it with me. We both decided that the child was in so bad a condition, and yet the fluid was not in very large quantity, that there was in all probability some visceral disease as well. The child died the next day, and I went to its home and made

¹ Ewald, in the 'Charité Annalen,' shows from his collected cases that early incision leads to more favorable results than incision after some time has elapsed. I think it very likely that this is so ; not, however, so much because of changes which have meanwhile occurred in the lung—unless, indeed, a bronchial fistula has formed—but because of the habit of suppuration, which the chronicity of the process has engendered in the pleural membrane, and the consequent intractability of the abscess-wall.

a post-mortem. The left chest was full of pus, but there was no other disease whatever. A similar excessive wasting has occurred in other cases; and it would seem, a thing by no means surprising, that the mere presence of pus in the pleura may kill; whether fever or pain, or the noxious presence of the pus is the most detrimental to nutrition, I do not know; probably each and all act more or less in different cases. But when emaciation is present, the temperature may be quite low. It is also to be noted that when the patient is much emaciated, there may be no distress even with a chest full of fluid. As in cases of creeping phthisis, the body wastes and the lung becomes diseased *pari passu*, so that one with chronic phthisis may sink into the grave without any distress, the lessening lung being always just competent for the work required of it: so here the emaciation is liable to mask the extent of the mischief, or even to lead to a wrong diagnosis of phthisis or some other visceral trouble.

2ndly. Allusion has just been made to the temperature. In a great number of cases it is a very valuable help to the diagnosis of the nature of the fluid. In children empyema is so much more common than a large effusion of serum, that if a case requires tapping, it is probably a purulent effusion. Still it is not always so, and the temperature may help. But it is liable to fail in such instances as have just been mentioned, and in very chronic cases.

3rdly. The fact of the existence of good though feeble vesicular murmur rather extensively over the affected side is no contra-indication to an operation if the other physical signs leave no doubt of the presence of fluid, or even if the distress is great without evidence of the fluid being in large excess. A careful exploratory puncture will do no harm should it fail to indicate the presence of pus, and may be repeated in some other spot; and if pus is found it may be easily reached by an external incision and the use of the dressing forceps for the deeper parts after Mr. Hilton's method, without any danger of injury to the lung.

Many believe that the presence of vesicular murmur in these cases is explained by its transmission from the opposite side, and strongly in favour of this is the fact that fair respiration over the diseased side is not unfrequently heard,

even where after death the tissue of the lung has been found quite airless.. But I doubt if the post-mortem appearances exclude the possibility of the diseased lung having been used to some extent. It is of course certain that nothing like full expansion has taken place, but there is no great improbability that the central parts of the lung have done some work, and sufficient to explain the occurrence of audible vesicular murmur. The compressed cortex would convey this to the posterior part of the chest-wall, and so more or less round the chest. Its conduction after generation will necessarily vary for different individuals according to the position of the lung in relation to the chest-wall, the density of the fluid and its amount, and the tension of the chest-wall. But if these remarks hold true with regard to the chest before paracentesis, there is the difficulty still behind, that vesicular murmur is to be heard afterwards, and in cases in which air has been admitted to the chest; but even then it may be explained by some sort of expansion of the compressed lung. It is difficult to imagine that a lung so situated can expand at all; but to take an extreme case, I remember watching some years ago the left lung of a man whose chest was freely laid open and the lung exposed to view by a severe injury. He lived for some minutes panting violently with his other lung, and the injured viscus also expanded slightly with each inspiration. I am not prepared at the present time to say why the lung under such circumstances is able to expand, but leave the facts as they stand. That no air is found in the lung post-mortem is explained, I think, by the elasticity, which is equally a property of lung tissue and of lymph. It is making no more of the fact than one has to do in other cases, such as extreme atelectasis pulmonum in children, or advanced heart induration with pulmonary apoplexy in adults. In both these conditions it is difficult, not to say impossible, to explain the prolongation of life with so small an amount of lung tissue as appears after death to be available. It can indeed only be explained by the supposition that the central parts have done some work, and that the traces of what little they have done have been obliterated subsequently by the contraction of the surrounding parts.

It may be said that, after all, it is an unimportant ques-

tion whether the sounds are transmitted from the healthy side, or produced on the diseased one, if on either hypothesis, the lung is confessedly not of much use. Granting this for the moment—but I believe, if the entrance into the pleura is not free, the lung may still be of very much use—the question is quite worthy of discussion, if only to impress upon the mind that the presence of vesicular breathing on the diseased side should not deter us from advising an operation if other symptoms render one necessary, for it gives no indication of the *amount* of expansion of the lung. But it may, I think, be concluded that under such conditions the lung is free from any material consolidation, and therefore still capable of active exercise should the empyema heal.

I have already alluded to the frequent presence of diarrhœa in children who are the subjects of empyema, and on one or two occasions this symptom has proved useful as an indication of the presence of pus, both on its first formation and also on its re-accumulation. Its presence may thus serve as an aid to distinguishing between pus and serum. Baccelli and Valentiner¹ think that the two forms of effusion can be distinguished by noting the variations which occur in the transmission of sounds through them; that the conduction of sound is not the same for one fluid as the other. This is, from the different densities likely to occur in the two kinds of fluid, highly probable; but whether we shall be able to make use of such a distinction for purposes of diagnosis seems to me somewhat doubtful. But that is a question which can be easily tested and settled.

With reference to the cases themselves, of which I now propose to give a short abstract, seeing that the number dealt with is large, and that the reports of many are necessarily lengthy, owing to the long period over which they extend, it is of course impossible to go into much detail. But looking only to the number of cases collected, the paper may be of some value for future reference, and I have thought it more satisfactory to give a few more facts in many of the cases than could be compressed into the opening table, especially those relating to the onset and the duration of the disease.²

¹ 'Berliner Klinische Wochenschrift,' May, 1876.

² With regard to the *duration* of empyema under the different forms of treat-

They are arranged in four groups according to the treatment adopted :

a. Cases treated by subaqueous drainage.

β. „ by incision.

γ. „ by paracentesis alone.

δ. „ without operation.

The number at the head of each case refers to the position it occupies in the table. A few cases are omitted because the table contains all the essential information that I could give.

a. Cases treated by Subaqueous Drainage.

CASE 9. *Double pleurisy ; right side ; empyema ; paracentesis ; subaqueous drainage ; pneumothorax ; wound still discharging.*—Philip C—, æt. 26, admitted May 12th, under Dr. Fagge, discharged August 5th, 1872. Quite well till three days ago, when he was seized with sharp and severe pain in the side. Temp. 99° to 101° . Dulness at both bases and pleuritic rub. May 29th.—Breath fœtid. Diarrhœa. No air enters the lower lobe of the right lung. 30th.—Tapped between sixth and seventh ribs. Subaqueous drainage ; 8 oz. of fœtid pus. June 8th.—Tympanitic resonance. Amphoric breathing and metallic tinkling. 15th.—The tube has worn itself loose and come out. The chest washed out. July 19th.—The chest has flattened on the right side. Air enters fairly. Still a good deal of discharge. He left in this condition.

CASE 11. *Left empyema ; aspiration ; paracentesis ; well.*—Rose P—, æt. 3, admitted under Dr. Wilks, August 21st, discharged December 21st, 1873. Temp. 100° . Sallow. Left side dull, nearly all over. Left side flat. Heart on right side. September 8th.—8 oz. of pus removed by aspirator from the lateral region between seventh and eighth ribs. Sweating much. 20th.—Paracentesis and subaqueous drainage in seventh space below inferior angle of scapula. 22nd.—Inflammation around tube. She made steady progress. December 18th.—Considerable flattening beneath clavicle with bronchial breathing. Below this the respiration is deficient, but fair : a little crepitation.

ment, I have not thought it advisable to give an opinion. Individual cases vary so much that on such a point it is better to let the cases speak for themselves.

CASE 12. *Left empyema ; paracentesis, September 23rd ; tube removed, December 23rd ; paracentesis again, January 18th ; well.*—Alfred C—, æt. 8, admitted under Dr. Pavy, September 20th, discharged March 28th, 1873. Quite well till a month ago, when he had pain in the side. September 23rd.—Paracentesis, Oij of pus, subaqueous drainage. December 6th.—Marked flattening. Has had diarrhœa. January 10th.—Discharged, but readmitted on January 18th.—Side full again. Paracentesis, 12 oz. of thick, very fœtid pus. Temp. 103·2° ; pulse 122 ; resp. 40. A tube put in and retained till March 8th. No albumen in urine. Left hospital with wound closed by granulations. Breath sounds loudest in the subclavian region. Much flattening. Heart in normal position.

CASE 15. *Left empyema, fifteen weeks' duration ; thoracentesis ; subaqueous drainage ; tube finally withdrawn at end of twelve weeks ; recovery.*—Albert I—, æt. 10, admitted under Dr. Taylor, August 27th, discharged December 12th, 1873. Cough for a year. Fifteen weeks ago severe pain in the left side. September 5th.—Mr. Howse effected subaqueous drainage by a flexible catheter in the sixth space just in front of the scapula. Heart's action became quiet and temp. fell from 99° to 97°. The tube slipped out on October 24th, and as no more than one inch could be replaced it was removed. Very little abnormal to be heard in chest. He appears to have had no further discharge and to have left well. December 22nd.—Dr. Taylor writes : The left chest seems to have decidedly filled out ; it is generally fairly resonant, though less so at the base than normal. Air enters freely everywhere even close to the wound, which is represented by a small granulation the size of a split pea.

CASE 16. *Left pleuritic effusion, becoming purulent ; aspiration, subaqueous drainage, and counter-opening ; well.*—Alice W—, 12, admitted under Dr. Moxon, January 12th, discharged April 24th, 1874. Had cough for some years. Chorea last year. Taken with violent pains in chest about ten days ago, and disagreeable sweating. The aspirator was used at first, and eighteen ounces of serum removed, but four days later, there being again signs of intrathoracic pressure, paracentesis and subaqueous drainage were adopted. The tube was

removed on the eighteenth day, but the discharge of offensive pus continued profuse. To obviate this a counter-opening was made low down, and the chest syringed. No fresh proceedings were required; the discharge gradually ceased, and she left the hospital convalescent with a shrunken chest.

CASE 17. *Acute pleuro-pneumonia, left side; empyema; paracentesis; subaqueous drainage; recovery.*—Leighton G—, æt. 8, under the care of Dr. Price Jones of Surbiton, with whom I saw him in consultation. The onset was that of sudden acute pain in the left side during cold snowy weather. He had been previously in good health, though a sensitive excitable child. He was tapped by Dr. Jones on the eighteenth day, and two pints of sweet pus drawn off. It was allowed to re-accumulate before taking any further measures, and on the thirty-eighth day subaqueous drainage was adopted. By this means the chest was regularly drained for about six weeks without a single bad symptom. Then the tube became choked and it was withdrawn. The wound healed over almost immediately, but a little pus re-collected in the chest and the temperature, previously low, rose. In about three weeks' time an opening formed spontaneously in the scar, and continued to discharge for about two months longer, when it finally closed. The chest was much contracted at first, and the spine curved laterally towards the left side, and for some weeks bronchial breathing was audible over the scapular region, but all these conditions have disappeared, and now, two years after the original injury, the boy is in perfect health and with no difference to be detected in the two sides of his chest.

CASE 20. *Left empyema; paracentesis; subaqueous drainage; recovery.*—Alice R—, under 10, admitted to the Evelina Hospital, under Dr. Playfair, early in March, 1871. A month before admission she woke up suddenly, complaining of pain in the side. Paracentesis was performed on March 28th, and again on April 8th; at the latter date subaqueous drainage was carried out. The tube was kept in the chest till June 10th; the wound closed by June 30th, and she left the hospital well on July 5th, the respiratory murmur being good all over.

CASE 22. *Left empyema; subaqueous drainage; well.*—Lavinia K—, æt. 6, admitted to the Evelina Hospital under

Dr. Hilton Fagge, September 12th, 1872. She had been taken ill with fever four months before, and within a few days had pain in the side. She was tapped and a tube inserted on the 17th. It was removed seventeen days afterwards, and she left the hospital well in a few days. She has been under my own care as an out-patient within the last year for general debility. The left chest was in all respects normal except the very slightest flattening beneath the left clavicle, and had the mother not informed me of the former illness, no suspicion of the empyema would have been aroused.

CASE 23. *Left empyema; disease of hip-joint; incision; subaqueous drainage.*—George G—, æt. 5, admitted to the Evelina Hospital under Dr. Hilton Fagge on August 25th. His illness commenced eight weeks ago with fever. The chest was incised on September 30th, over a prominent oval swelling round the nipple. Five days later a drainage tube was put in, as the pus seemed very confined, only coming away when the wound was dressed. It was removed on November 1st, and by the 30th the discharge had become very slight. The temperature had been normal for some time.

CASE 24. *Right empyema; subaqueous drainage; sinus remaining.*—Hannah S—, æt. 5½, admitted to the Evelina Hospital under Dr. Baxter's care on June 15th, 1876. She had been quite well till May 30th, when she came home from school hot, sweating, and sick. The bowels had been loose, and she had wasted rapidly. She was tapped by Mr. Paley on the 24th; only two ounces of pus came away at first, but after that a continual drain of two ounces or so daily.

The child has been readmitted within the last few days (January, 1877), and I made a careful examination of her chest with Mr. Paley. She is pale, but not thinner than when discharged, and there is as yet no evidence of any amyloid change in the viscera. She has a continual discharge of healthy pus from the side, an ounce or two daily. The chest is a little retracted in its antero-posterior diameter. Respiration vesicular but feeble. A probe passed in at the aperture in the chest wall passes in for three inches towards the root of the lung, and though the range of motion allowed to the probe is limited, I think there must be a considerable cavity. The lung appears

to expand but little to judge by its extruding force when acting on the probe.

CASE 27. *Left empyema ; subaqueous drainage ; recovery.*—Berisch L—, æt. 2, admitted to the Evelina Hospital under Dr. Frederick Taylor's care, February 5th, 1876, and discharged May 2nd. His illness began after measles ten or eleven weeks ago. Subaqueous drainage was adopted the same day, the tube being inserted below the angle of the scapula. The tube was removed on the eighth day, as the pus had diminished to one ounce a day, and the temperature was low. But after this he had repeated fever and diarrhœa, and subsequently pus discharged itself daily by the wound. For this it was necessary to reinsert a drainage tube from March 29th to April 30th, when it was finally withdrawn. He was discharged well on May 2nd. He returned for examination on May 20th, and the left chest was then found resonant all over. Respiratory murmur heard clearly, even round the scar. He has been seen again since and remains quite well.

CASE 29. *Right empyema ; subaqueous drainage ; retraction of chest ; amyloid viscera.*—John P—, æt. 3, admitted to the Evelina Hospital, under Dr. Frederick Taylor, July 2nd, 1875. He was taken with cough and diarrhœa seven weeks ago. Paracentesis was performed and a tube inserted in the fifth space in front of the posterior axillary line. The pus never ran well, and the tube was removed on the eighteenth day. He slowly improved in general health, and the wound healed. But the side remained dull, and the respiration deficient. He gradually lost weight, the urine became highly albuminous, the liver reached to the umbilicus and the spleen was palpable. The chest was much distorted, and there was loud cavernous respiration at the right apex. No evidence of disease on the other side. This patient has died since the paper was written, and unfortunately the post-mortem was refused by the friends,

CASE 75. *Left empyema ; subaqueous drainage ; death.*—Elizabeth C—, æt. $2\frac{1}{2}$, admitted to the Evelina Hospital under my care, on July 14th, 1876. She had been quite well till seven weeks before. Eight ounces of pus were withdrawn by Mr. Paley, and a tube inserted as usual. She did well for a

fortnight, when the temperature began to fluctuate in a manner indicative of pent-up pus. Large doses of quinine failed to check this, and the tube was removed on August 12th. The opening appeared thoroughly patent, but two days after it became evident by redness and pain below the nipple that some pus had shut itself up in the lower and front part of the pleura, and was making its way forward there. A little pus was withdrawn from this spot by an exploring syringe, and an attempt was made, by means of a long probe, to open a communication between it and the original wound. The upper rib prevented the accomplishment of this, and no further measures could be attempted because the parents removed the child. She attended as an out-patient for a short time longer, gradually wasting, while the discharge continued profuse. She died away from the hospital unknown to us, on November 10th. At the last examination of the chest there was nothing to indicate any disease except the one-sided empyema.

CASE 33. *Left empyema, localised (?) ; subaqueous drainage ; relief.*—William H—, æt. 12, was admitted under Dr. Hilton Fagge July 10th, 1872, and discharged finally January 29th, 1873. He gave a history of fourteen months' illness, with copious expectoration of pus. Subaqueous drainage was effected by Mr. Howse on July 31st. The tube was removed three weeks later, as it became blocked. The discharge continued; the chest contracted to $1\frac{1}{2}$ inch less than the other side; the spine became much curved, and the boy walked one-sidedly. Next a large collection of pus opened spontaneously. He left with a discharging sinus; the lung, however, appeared to be expanding well.

CASE 42. *Left empyema ; subaqueous drainage ; recovery.*—Henry H—, æt. 4, admitted to the Evelina Hospital under Dr. Hilton Fagge, April 23rd, 1872. An india-rubber tube was inserted into the chest on the 25th, and retained till May 28th. He left, well, on June 19th. The respiration was then vesicular all over the diseased side, but weak. Some dulness still continued.

CASE 43. *Right empyema ; subaqueous drainage counter-*

opening; albuminuria.—Annie D—, æt. 6, admitted to the Evelina Hospital September 3rd, 1872, under the care of Dr. F. Taylor. She had been ill six weeks. Ten days later the chest was tapped near the inferior angle of the scapula and a tube introduced. A little pus flowed and then suddenly stopped, so it was thought advisable to withdraw the tube and put it in more posteriorly. Pus continued to flow from this opening till October 12th, when, as it was small in quantity, the tube was withdrawn, and in a week the wound had healed. The chest remained absolutely dull, and the vesicular murmur harsh. The last note of the case records the fact that the urine was loaded with albumen and contained hyaline and granular casts. She left the hospital without any dropsy.

CASE 50 (reported by Mr. A. G. Barrs, M.B.). *Empyema; broncho-pneumonia; paracentesis; suppurative peritonitis.*—William S—, æt. 2, admitted under Dr. Pavy, September 30th, 1875. The child has been an out-patient for the last five weeks, at first for bronchitis, afterwards for pneumonia. He is pale and much emaciated. He can lie in any posture, but by preference chooses the right side. He has frequent diarrhœa and frequent dry, painful cough. Movement of the right side of the chest is much impaired, and this side is also rounded and bulging. Tactile vocal fremitus is absent, and there is dulness all over except between the right scapula and spine. On the left side the percussion-note is good. On auscultation there is bronchial breathing beneath the clavicle, and below this faint and obscure breath-sounds. The right side measures 10 inches, the left $9\frac{3}{4}$. The heart beats an inch external to the nipple. The temperature was normal, and rather below occasionally. Thoracentesis was performed by the house-surgeon in what appeared to be the seventh space. Air was admitted to the chest by the canula. Sixteen ounces of healthy-looking pus came away. Subaqueous drainage was resorted to. The side became flattened and resonant after the operation, and the movements of the chest almost equal on the two sides. The liver also resumed its place. The heart's apex could not be localised. The cavity of the pleura was washed out daily with carbolic acid lotion. Oct. 13th.—Sick. T. $101\cdot4^{\circ}$; P. 152; R. 48. 14th.—Profuse diarrhœa last night. Con-

siderable purulent discharge from the chest. 16th.—Pus from chest putrid. Physical signs as before. Temperature now falling. He died the same night.

At the post-mortem, general suppurative peritonitis was found extending from a small slit in the diaphragm, which was too recent for the length of time which had elapsed since the time of the operation, and too old-looking to be of post-mortem production. The peritoneum round this was much injected. The chest had been opened in the ninth space, and the trocar must have passed very close to where the opening in the diaphragm was situated. No pus in the pleura. The membrane much thickened and covered by tough lymph. Both surfaces of the pleura eroded in places. The right lung was of less volume than normal from partial collapse, and also dense and resisting from inflammatory products deposited here and there in small spherical masses, chiefly at the base. The left lung and other viscera were normal.

CASE 45 (reported by Mr. Henry Clarke). *Right pleuritic effusion; empyema; coma; death.*—Jessie B—, æt. 16, was admitted under Dr. Habershon, October 16th, 1875. Her mother died two months ago of galloping consumption. She had had good general health, but for the last two years has had cough. Since her mother's death she has been ill, with rigors, flushings, and increase of cough. A month ago she fell over a can and struck her right side; she suffered from pain for a few days, but soon appeared to recover entirely. Twelve days ago she caught severe cold, had sore throat, difficulty of swallowing, anorexia, and increase of the cough. On admission, the right side was dull all over, the lower part of the chest scarcely moving at all. The absence of all breath sounds was complete, except distant bronchial breathing at the root of the lung posteriorly. No vocal resonance or tactile vibration. The intercostal spaces were obliterated and the right chest, as a whole, was perceptibly enlarged. The heart's apex beat was external to the nipple. The respiration was greater over the left chest. The hepatic dulness did not extend below the margins of the ribs. The temperature was 102°, both morning and evening. She was ordered Emplastrum Lyttæ to the chest and took Citrate of

Potash and Liq. Morphiae. The temperature remained high, but without evening rise, and on the 22nd the chest was tapped: an aspirator was first used, and some pus coming away, a large trocar and canula were passed and a drainage-tube inserted. By this means subaqueous drainage was carried out. By the next morning 2 pints 6 oz. had drained away, the temperature gradually falling. On the 24th and 25th 6 oz. and 5 oz. of pus were discharged. Temp. 99.8° . The patient had constant cough after the operation, and did not at first seem much relieved. The tube was withdrawn on October 25th, and the chest washed out daily afterwards. The pus was noted to be fetid on the next day (26th), but the temperature was still below 100° . November 3rd.—The drainage-tube was reinserted and the chest washed out twice daily with carbolic acid lotion, 1 in 60, as before. 9th.—About 4 oz. of pus drain away daily. Partial resonance over the whole of the right chest anteriorly, and breath-sounds audible down to the fourth rib. She went on gradually improving till the 26th. On that day she was sitting up in bed as usual to have her chest washed out, at about 12.30 noon, when, without any previous warning, she suddenly turned livid and fell back into the arms of the nurse. She ceased to breathe, and no pulse could be found at the wrist. There was no convulsion of any sort. Artificial respiration was immediately commenced, and in about ten minutes the respiration was re-established, and the pulse could be felt feebly at the wrist. She was perfectly insensible, and never recovered consciousness in the slightest degree. As breathing was re-established the colour returned to the face; but about an hour after the attack commenced it was noticed that the right side of the face and the right arm and hand were very blue and congested. Not so the left. Later on the difference in the two sides disappeared, and profuse sweating occurred over both sides of the head and neck. The legs were not altered. Respiration was about 40; pulse 120, varying considerably in strength at different times. The temperature at 1.30 p.m. was 97.6° , at 3.30 p.m. 96° , the surface of the body feeling cool; at 9.30 p.m., just before death, it was 94.4° . The urine and fæces were discharged involuntarily soon after the attack commenced. In the first two or three hours the pupils

were contracted, but not very small; later on they dilated, always being equal and responsive to light. Both the arms were contracted and rigid, but the right side much more than the left, which became flaccid again after a time. There was no paralysis or rigidity of the legs. At 2 p.m. a transitory paralysis of the right side of the face was observed. She moved both arms about alternately for the most part, and the left with more power than the right. She opened and shut her eyes and moved her eyeballs. There was no strabismus. At 4 p.m. her breathing was semi-convulsive, stopping and then continuing again, with some slight convulsive movement of the mouth. A turpentine enema and three drops of croton oil were administered, the one after the other had failed, both without result. She continued quite unconscious, gradually becoming livid and cold, and died at 9.30 p.m., the respirations gradually ceasing.

The post-mortem showed the right lung to be carnified, the pleural cavity being obliterated by adhesion and bands of lymph. The parietal layer was seven sixteenths of an inch thick from granulations, and there appeared to have been some old cheesy change between the right lower lobe and the pleural aspect of the diaphragm; but excepting this, the lung was healthy though compressed. The other lung was healthy. The brain and spinal cord were quite healthy. The membranes, sinuses, and vessels were searched, but without finding any evidence either of thrombosis or embolism. The heart was of normal size: its pericardium, where adherent to the lung, injected, and a few flakes of lymph were found about its base. The valves and cavities were healthy. The clots in the latter in no way helped towards explaining the cause of death. But on looking at the septum ventriculorum from its aspect towards the cavity of the left ventricle, it was seen to be of a purplish tint as if from some dark substance in the muscle. Sections of the septum showed that from its base downwards its greater part was infiltrated or stained with blood. Towards the base the muscle was extensively and evenly stained; but farther towards the apex the ecchymosis limited itself to the environs of a large coronary vein. The muscle so affected was unaltered in consistence; if anything, perhaps it was rather more tough than usual. The coronary sinuses and

arteries were carefully searched without finding any clot or other cause for the hæmorrhage. I have recorded this case in the 'Transactions of the Pathological Society' because, though I could find no clotting in the vessels supplying the muscular structure of the heart, yet the appearances were so like those due to embolism that it seemed quite possible that such a thing might have happened. But, whether or no, the extravasation amongst the muscular bundles of the wall of the ventricle is some explanation of the proximate cause of death. It is necessary to give the case somewhat in detail again here, because it is the only instance so far as I can find that has occurred at Guy's of sudden death by cerebral symptoms after surgical interference with the pleural cavity. I have before alluded to the rarity of such a termination; but cases have been recorded by French authors, and Dr. Cayley has published one in the 'Transactions of the Clinical Society.' Similar ones have also been mentioned at the same society by Dr. Theodore Williams and Mr. Butlin, though they are not recorded in the published volumes. With reference to the question of embolism, this case must be taken for what it is worth; that is, nothing at present till more of the kind have been put on record. With regard to the course of the disease, it coincides with other cases exactly; and whatever may ultimately prove to be the correct explanation of any one, will probably explain the cause of death in all.

CASE 52. *Left effusion and empyema; thoracentesis; thrombosis; death.*—Henry L—, æt. 28, admitted under Dr. Moxon, March 21st, and died April 13th, 1874. One brother died of phthisis. He is a compositor, has had syphilis, and seven years ago a severe attack of pleurisy on the left side. He has been very well since. Two months ago he began to have stitch in the left side. A fortnight ago he woke with horrible pain in that side, and he drew breath in gasps. Since then he has been ill. The left side is bulged; the intercostal depressions gone; the side less moved; œdema of this wall; and the chest dull all over left side. Heart displaced to right of sternum. Breath sounds distant in front, bronchial behind. Voice ægophonic. Temp. 102°. He was treated at first by a reduced diet. He did not improve under this treatment, and tapping

in the sixth space with subaqueous drainage was subsequently adopted (26th). The fluid was serous, containing flakes and alkaline; 48 ounces came away. A little air entered the chest at the operation. He improved for two days or so, but the tube got blocked almost immediately after the operation and its removal was necessary on the 31st. The temperature was very high; the general symptoms bad. He was sweating profusely, and the heart's action was laboured. When the tube was removed, three pints of sero-purulent fluid came away, and this rapidly coagulated. Again no fluid came through the tube, though it escaped around it; and he still sweated. On April 7th a fresh tube introduced, No. 10, black French catheter. The fluid escaping now distinctly pus. Temperature still high, and he is delirious. 10th.—Chest washed out with Lotio Pot. Permanganatis; but he gradually sank with fever and delirium.

At the post-mortem the left lung was found bound down by recent lymph and carnified, and under the original pleura were tubercles. Some old cheesy remains at the apices. Otherwise the lungs were healthy, though with much thickening of the diseased pleura. The bronchial tubes on the side of the empyema contained thick pus towards the base. The lung was not fibrous.

CASE 61. *Left empyema.*—Celia F—, æt. 2½, was admitted to the Evelina Hospital under Mr. Howse Sept. 4th, 1873. The child was weakly for her first year. Weaned at sixteen months. During last eighteen months has been very well, except for the whooping-cough last winter. The family history is bad. Of nine children by the mother only four are now alive. Ten weeks ago, whilst at play, she was taken suddenly with vomiting, which was not known to be due to any alteration in her diet. The child became weak and ill, and had a very bad cough. She had medical advice, and also attended as out-patient at Ormond Street. She gradually wasted, had much difficulty in breathing, and seemed to be in pain in the left side when moved. On admission there was dulness all over the left side. Respiratory sounds distant. The heart pushed over to the right side. The intercostal spaces full but not bulging. The chest was tapped,

and a large quantity of pus evacuated. It was then left to drain by a flexible catheter in the chest and tubing attached to it conducted under water. She was ordered Sp. Ammon. Aromat. $\mathfrak{m}\mathfrak{v}$, Sp. Æth. Sulph. $\mathfrak{m}\mathfrak{j}$, t. d.; wine $\mathfrak{z}\mathfrak{i}\mathfrak{j}$. The child's temperature is said to have gradually gone down till the 13th, when it stood at 99° . From the 13th to the 19th it remained low, and then ran up to 104.8° , the child becoming ill and fretful. 21st.—Morning temp. 99° , evening 104° . She had rigors and coldness of surface to-day. 22nd.—Morning temp. 99.4° . Not much discharge from the chest now, and she seems to breathe comfortably. Two children have varicella in the ward. It is thought that the fever she now suffers from may be due to the same thing. 24th.—Child looks ill and distressed. Is sick and restless. Has been sick after everything since yesterday morning. Evening temp. 23rd, 103° ; to-day, morning, 101.4° . Wine, $\mathfrak{z}\mathfrak{i}\mathfrak{v}$. 25th.—She vomited up to midnight, when she was pulseless, quite cold, and thought to be dying. Temp. 105° at 7.30 p.m. The tongue brown, and breath horribly offensive. Mr. Howse took out the tube from the chest, and covered the wound with carbolic gauze. Tongue cleaner this morning. Temp. 100.4° , P. 156. Eyes sunken. Drummy resonance all over the left chest. No respiratory sounds. Less sick. Enemata return. 27th.—Continued much the same. Sick every now and then. Had pain in right side, and gradually sank at 1 a.m. Temp. 101.4° at 6.25 p.m. The post-mortem was refused.

CASE 65. *Left empyema; albuminuria; convulsions.*—George N—, æt. 4, was admitted to the Evelina Hospital under Dr. Hilton Fagge on December 22nd, 1871, and died January 12, 1872. The mother died of phthisis a year ago. He had scarlatina seven weeks ago. He is restless, lies on his left side. Very thirsty. The bowels relaxed. The left side of the chest is dull. The heart's impulse is behind the ensiform cartilage. No tactile vibration on either side. The right chest moves freely, the left not at all. Slight œdema of the feet. 26th.—Paracentesis was performed an inch below the angle of the scapula, and through this an india-rubber tube was passed into the chest, the other end being placed in a bottle of carbolic acid lotion (1×20).

Fifteen ounces of pus were removed, and the left chest began to move nearly equally with the right. Vesicular breathing returned, and the heart's beat could be felt near the left nipple. 27th.—Had a bad night, moaning all the time. He has passed a pint and a half of urine, which contains $\frac{1}{20}$ albumen. 28th.—Four ounces of pus have come away since the 26th. Respiration is rapid and superficial. Some redness in various parts of the trunk. Skin dry. 29th.—Left base fairly resonant, with vesicular breathing anteriorly. At base behind bronchial breathing. 30th.—The tube was removed and found to be stopped by thick pus which adhered about the apertures in the tube and resisted all efforts to remove it by blowing. From the amount of resonance and the character of the breathing it was thought that possibly there might be a pneumothorax. Urine 1012, albumen $\frac{1}{10}$. January 3rd.—Heart's apex in normal position; a great deal of pus is discharged through the sinus left by the tubing. Crepitation over left base. 5th.—Discharge much less. Tubular breathing left side below the scapula. When sitting up leans to the left side. 6th.—Dulness over all the left chest, most marked at the base. No vesicular murmur. Tubular breathing and prolonged expiratory blowing. Pus flows out when the child cries or takes a long breath. 8th.—Since the 6th air has entered freely through the wound on respiration. The chest is washed out with $\frac{3}{4}$ ij of Condy's fluid. The pus is quite healthy, and in small quantity. The child sleeps well. 12th.—He had an uræmic convulsion, all the extremities being affected, the right more so. He is greatly emaciated. A fetid odour comes from the wound. The convulsions continued and the child died.

At the post-mortem a hand could be inserted between the left lung and the chest wall. There were old adhesions of the left pleura. The whole surface except the apex posteriorly was covered by thick lymph. No communication with the lung, which was crepitant and healthy. Kidneys enlarged and moderately affected by nephritis. The other viscera healthy.

CASE 66. *Left empyema; death.*—George E—, æt. 9 months, was admitted to the Evelina Hospital under my care, on June 13th, 1876, and discharged on the 26th. It died subsequently. It was the mother's first child, she being 32 years of age, the father

54. It had been fed by the bottle at a "farm." It had been wasting five weeks. On admission it was a wretchedly thin, old-fashioned baby. Pulse 116; respiration 40. The left side full of fluid. 14th.—Mr. Paley tapped the left chest in the lateral region of the thorax and about 3ss of very thick pus was evacuated, but would not run easily. A tube was put in and subaqueous drainage adopted. The tube was removed on the 16th, as no pus came through it. 19th.—No discharge from the opening. No diarrhœa. Bowels not loose. Temperature has risen to-day. 20th.—Temperature 100°, P. 97. Breathes easily. Chest still dull over left side. 23rd.—Chest is becoming resonant. After last note a discharge of about 3j of pus took place from the wound and the temperature has fallen since. The child left with the wound healing, the respiration being loud over the posterior part of the lung. The heart in normal position and the child gaining weight. The chest continued to discharge a little and the child soon wasted again; it died on July 16th, 1876. I was unfortunately away at the time and no post-mortem was obtained.

CASE 67. *Right empyema; subaqueous drainage; incision; death.*—Mary Ann M—, æt. 5, was admitted into the Evelina Hospital under my care on October 1st, 1875. She had previously been attending as an out-patient for two months. At her first appearance on August 3rd she had been ill a month, with shortness of breath and wasting. The right chest was of peculiar shape, flattened beneath the clavicle, bulging beneath the third, fourth, and fifth ribs, and contracted again below. There was also a local bulging in the lateral region at the base. The depressed parts gave a dull note on percussion. The bulging ones tympanitic resonance. The bulging subsequently became general; the breath more short and the liver depressed to the umbilicus. She was then admitted and subaqueous drainage resorted to. She was much relieved and did well for twelve days. Then a little sloughing took place round the tube and the contents of the pleural cavity became offensive, so the tube was removed and syringing adopted. The temperature continued to fluctuate much and she gradually wasted, and under these circumstances Dr. Taylor, who had now taken charge of the patient, considered it better to make a counter-

opening posteriorly and pass in a tube between the two. By this she was much relieved, the temperature falling and the discharge becoming both less offensive and less copious, but a bed sore formed as she was much emaciated, and she died January 12th, 1876. The right lung was retracted towards the middle line, and bound down firmly to the spine; it was adherent at the apex, along the root and to the upper surface of the diaphragm. The pleura was much thickened. The apex and front edge of the lung crepitant. The remainder collapsed. No tubercle was found anywhere.

CASE 68. *Empyema; left side.*—Charles R—, æt. 4, was admitted under Dr. Buchanan Baxter, May 3rd, and died on May 4th, 1875. It had measles a month ago with a good deal of chest mischief. Three weeks ago it began to breathe quickly, but had no pain in the side. It had dulness all over the left side, back and front, with distant breath sounds; lips livid; much dyspnœa, and a pulse hardly distinguishable. It was tapped subsequently, ten ounces of pus ran during the night, and next day it seemed better. It died suddenly the next evening.

The post-mortem showed an old-standing effusion of pus in the left chest. The lung bound down, airless, and covered with a thick coating of lymph. Recent pleurisy over the anterior border of the right lung with effusion of lymph on its surface; no fluid. The pericardium was adherent to the lung on the left side; the heart flabby; the other viscera normal.

CASE 69. *Left empyema; subaqueous drainage; death.*—James W—, æt. 4½, was admitted under Dr. Baxter into the Evelina Hospital on April 26th, 1875. It had been ill a month with pain in its side; fever, cough, diarrhœa and sweating. It was considerably emaciated, the left chest dull all over, and the heart displaced. An exploratory puncture was made on the 10th, and thick viscid pus was withdrawn. Upon this subaqueous drainage was adopted in the ninth space behind the mid-axillary line. A moderate quantity of *fluid* escaped through the tube, but no pus. Next day the temperature rose to 104·8°, and on the 13th the child had abdominal pain, distension, and sickness (peritonitis?). It died on May 15th. The post-mortem was refused.

CASE 70 (reported by Mr. Andrews, registrar).—*Left empyema; subaqueous drainage; death.*—Walter C—, æt. 14 months, was admitted into the Evelina Hospital under the care of Dr. Baxter on June 22nd, and died on June 28th, 1876. The child was still at the breast, but taking other food. Ten days before he began to be dull, listless, and feverish. His left chest was dull all over, and the heart beat in the epigastrium. Moist râles and harsh breathing were heard all over the right side. The left chest was tapped by a large trocar and a drainage tube inserted, but the pus did not run freely. This was accounted for by the drainage tube doubling on itself. The next day the tube slipped out, and while it was being re-inserted, some ulcer in the pleura appeared to give way, and the chest filled with air which came freely through the tube during respiration. The heart, however, came back to its proper position, and the child was much relieved. It was thought at first that the lung might have been wounded, but the post-mortem shows that the former was the more probable explanation of the sudden escape of air into the chest. He did well for four days, pus and air coming out freely by the tube. But he then became restless, the temperature rising a little, to 100·4°, and only enough pus came to render the water turbid. The dressings, on the contrary, were soaked, so it was evident the tube was blocked. It was, therefore, withdrawn, but death took place the same evening apparently from disease of the other lung. The inspection made by Mr. Paley showed that the right lung was very emphysematous and collapsed in places. The left lung was shrunken back and bound down to its root and the whole of its inner surface, apex, and front of the upper lobe were coated with a greyish-yellow rough layer of exudation. Part of the outer surface of the lower lobe and its diaphragmatic surface were thickly coated with false membrane. The upper lobe was collapsed and dark in colour. On the outer surface of the lower lobe was a small circular perforation communicating with a small cavity in the lung and indirectly with a bronchial tube. At another spot was a small swelling which proved to be the bulging wall of a small pea-sized abscess full of creamy pus. On the under surface of the lower lobe were three small apertures communicating with a network of ragged cavities of various sizes which per-

meated the entire basal portion of the lung for a thickness of upwards of an inch. All around the lung was shreddy and gangrenous, but the disease was strictly limited to the lower part of the lower lobe. The rest of the lobe was simply carnified. No tubercle was to be seen anywhere.

CASE 31 (reported by Mr. Hammersley). *Right empyema ; paracentesis ; subaqueous drainage.*—Frank B—, æt. 9, was admitted under Dr. Moxon June 30th, 1876, and discharged October 25th, 1876. He had been ill a fortnight with fever and cough. The right chest was dull all over, the respiration only heard behind, and there but feebly. Paracentesis by the aspirator was performed on June 30th ; eleven ounces of healthy pus were withdrawn, and on July 1st fifty-three ounces were removed by subaqueous drainage. The tube was continued till about July 15th, and then was withdrawn ; it discharged very freely all the time. The quantity of pus gradually diminished, but on August 7th it had re-accumulated ; the dullness being increased, the breath sounds more distant, and the old wound opening suddenly. The temperature was now high, but this all subsided, and the wound ultimately discharged but little. The chest at the last note was thus described : There is boxy resonance from the clavicle to the second space, absolute dullness below. The breath sounds are much increased in the boxy region, and the expiratory murmur is harsh and blowing ; below this the breath sounds become deficient, and then cease altogether. There is some bronchial breathing and broncophony behind.

CASE 76 (reported by Mr. Judson). *Right empyema ; subaqueous drainage ; death.*—Jessie A—, æt. $2\frac{3}{4}$, was admitted under Dr. Taylor, June 20th, 1876, and died on July 16th. She had been ill since March, with cough, sweating, and diarrhœa. She was old-looking and haggard. The right chest flattened laterally, expanded badly, was dull all over, with somewhat bronchial respiration behind. Temperature 101° , evening temperature 103° . There was a good deal of diarrhœa and hectic, so on July 13th it was decided to tap the chest. This was done by Mr. Golding-Bird, in the fifth interspace posteriorly, and a drainage tube was inserted after-

wards. Two ounces of greenish inoffensive pus came away. On the 15th, as only about an ounce of pus had come away, the opening in the chest was enlarged and the tube removed. The child sank into a cold, clammy, stupid state, and died the next day.

I made the post-mortem on the following day. The pleura still contained some four or five ounces of pus. The posterior part of the lung was adherent in the intervertebral groove and the whole lung was nearly entirely airless from compression. Its substance was pale and the septa looked thick, but beyond this there was no evident change in its texture. The other lung was more or less adherent everywhere to the chest wall by recent adhesions and a thick layer of lymph, its lower part being rather compressed. The bronchial glands on the right side were caseous, as also the large compound gland at the bifurcation of the trachea. The tissues around them were not thickened, so that it is by no means certain that they were the starting-point of the empyema. On the contrary, I think it not improbable that their condition was really due to the empyema.

β. Cases treated by Incision.

CASE 10. *Left empyema after confinement; paracentesis; incision; rigors; temporary albuminuria; fistula still discharging.*—Anne G—, æt. 32, admitted under Dr. Wilks, July 15th, 1872, discharged August 14th, 1873. Sixteen days ago pain came in the side. She was confined a day or two before admission. On admission Mr. Howse performed paracentesis in the fifth space. Five or six pints flowed gradually by subaqueous drainage in about half an hour. During its flow the patient became greatly distressed, the heart fluttering and weak; and the respiration irregular. She gradually came round under the administration of brandy. Some difficulty was experienced in getting a tube in, so the canula was withdrawn afterwards. On the 24th trocar and canula introduced again, and by long forceps an india-rubber tube was pushed into the chest. August 10th.—Free incision, 10 oz. of very fœtid pus drained off. 24th.—Much flattening. Nov. 20th.—Tube put into chest again, a great deal of fœtid pus again drawn off. August 14th, 1873.—The chest has been washed out daily and the

cavity appears to diminish. She left the hospital to-day. The left side measured only thirteen inches, the right fifteen. Dull all over. No expansion. No breath sounds can be heard. The cavity still discharges a quantity of foetid pus.

CASE 13. *Left empyema ; paracentesis ; chest incised and syringed ; nephritis with hæmaturia ; recovery.*—Eleanor B—, æt. 5 $\frac{1}{2}$, admitted under Dr. Pavy, September 11th, 1872, discharged April 5th, 1873, readmitted May 7th, again discharged May 14th, 1873. Ill three months with cough and shortness of breath. October 21st.—Aspiration between fifth and sixth ribs at the posterior border of angle of scapula. Some air was admitted towards the close of the operation. On the 23rd, as signs of pneumothorax were present, an incision was made between the sixth and seventh ribs and a small quantity of pus escaped ; the chest was then syringed. The discharge continued till April 5th, when the chest healed. But a month later it opened again and dead bone could be felt at the lower border of the fifth rib. The breathing was tubular along the spine. She inclines to the left side and there is a good deal of crepitation to be heard all over this side. From December 17th to March 31st she suffered from renal dropsy. She was ultimately sent out in good general health, the side probably still discharging.

CASE 14. *Left pleurisy, effusion becoming purulent ; pointing ; incision ; counter - opening ; wound nearly healed ; chest shrunk.*—George P—, æt. 18, admitted under Dr. Moxon October 11th, 1872, discharged April 2nd, 1873. He got wet on October 6th. Two days after he was seized with rigors and pain in the left side. December 29th.—Empyema pointed one inch below and one inch external to nipple. This was opened and a tube introduced. The following morning the tube slipped out and some air was sucked in. The tube was not replaced. He was much easier, about three pints of pus were withdrawn. Now has painful cough. Left chest hardly moves. Tubular breathing from clavicle to third rib. February 17th.—He has had hectic for three weeks. A counter-opening was made as low as possible in the chest by cutting down on a probe passed in at the upper opening, and half a pint of pus

was taken out. 19th.—Free discharge; feels better; fever less. On discharge, the chest markedly flat; the heart displaced upwards and air entering very badly.

CASE 25. *Left empyema; incision; well.*—Emily M—, æt. 6, admitted to the Evelina Hospital under Mr. Howse, July 29th, discharged August 30th, 1876. The child was taken ill with sickness lasting about a week, six weeks ago. On admission the empyema was pointing in left anterior axillary line, seventh space. It was opened by Mr. Howse under chloroform with antiseptic spray. Copious discharge. Quin. Disulph. gr. ij t. d. s., milk, beef tea, rice, wine ʒij . She went on uninterruptedly well and was discharged with the wound healed. The chest was much shrunken and resonance impaired, but the vesicular murmur, though feeble, was fair. I have seen this child within the last fortnight (January 2nd, 1877). She is well and fat. There is slight flattening beneath the clavicle and the heart beats forcibly round the nipple, apparently either drawn upwards a little or uncovered by retraction of the lung. Slight loss of resonance all over the left side and respiration rather deficient.

CASE 26. *Right empyema; incision; well.*—Albert W—, æt. $4\frac{3}{4}$, was admitted to the Evelina Hospital under my care on August 12th, 1876, and he was discharged on October 1st; during the latter part of this time he was under the care of my colleague Dr. F. Taylor. The chest was incised in the ninth space close to the angle of the rib the day after admission. Carbolic spray and antiseptic gauze were used. The wound closed a month after, and he left well. The resonance on that side was slightly impaired, but air entered the lung freely all over. He has since remained quite well.

CASE 32. *Right empyema; incision; extreme retraction of chest; albuminuria.*—Daniel D—, æt. 17, was admitted under Dr. Pye-Smith, April 29th, 1874, and left November 22nd. He had had a cough for two months. He had a marked evening rise of temperature, and occasional profuse diarrhœa. The chest wall became œdematous and was incised in the eighth space. Fourteen ounces of pus came away.

The discharge continued gradually diminishing, and the chest fell in. On September 17th the right side measured only $14\frac{1}{4}$ inches, the left 17 inches. The urine became albuminous on September 8th, and remained so persistently till his discharge. He was readmitted in January, 1875, with a sinus discharging pus daily. The urine was then normal; no evidence of amyloid disease of the viscera. The right side was completely dull, much retracted, with vesicular murmur only on deep inspiration. He left on April 27th in the same state.

CASE 36. *Left empyema; paracentesis; incision; chronic lung disease.*—Frederick S—, æt. 18, was admitted under Dr. Wilks September 23rd, 1869. The previous history was very indefinite. Mr. Durham tapped the chest on October 23rd, leaving the canula in; a week later a catheter was substituted, and five weeks after the chest was incised. He was discharged on April 27th, 1870, and readmitted in October, 1872, for renal disease, probably lardaceous, and chronic disease of the left lung. A discharging sinus still remained and the left side of the chest measured $2\frac{1}{2}$ inches less than the right.

CASE 47 (reported by Mr. C. W. Lacey). *Right pleuritic effusion; paracentesis; re-collection of fluid; paracentesis; empyema; incision of chest; counter-opening; tuberculosis.*—Fred. H—, æt. 24, was admitted under Dr. Moxon October 27th, 1875, and died December 10th. Two sisters died of phthisis. His present illness began four weeks ago, when he caught a severe cold. Had severe lancinating pains in the right side of the chest for fourteen days. Much cough and expectoration of white phlegm. He had sputa tinged with blood last winter. The right lung was completely dull back and front, and there was slight tubular breathing. The heart was slightly displaced to the left side, the impulse diffused, a little outside and below the nipple. The liver pushed down to one inch below the level of the umbilicus. Thoracentesis by the aspirator was performed on November 2nd, and two pints four ounces of greenish fluid withdrawn, mixed towards the last with a little blood. He had much dyspnoea during the operation, but soon recovered. Percussion then elicited fair resonance to the third rib anteriorly and to about the fifth

rib posteriorly. From the report it does not appear that he had more than temporary benefit. The temperature, high before, still continued so, and on November 18th aspiration was again necessary. Ninety-five ounces of semipurulent fluid were withdrawn. He again had some dyspnœa, which soon disappeared. After this, well-marked signs of pneumothorax were noted, and on November 23rd the chest was incised in the sixth space midway between the sternum and spine by Mr. Golding-Bird. Twenty ounces of semipurulent fluid came away, and he had no dyspnœa. On the 24th thirty ounces of fluid came out when the wound was dressed; and while the chest was being washed out with carbolic lotion he had a severe attack of dyspnœa lasting half an hour. Subsequently he had other short attacks, though, meanwhile, the carbolic acid had been changed for permanganate of potash; they were thought to be due to the removal of the plug from the incision, for when this was replaced he got better. A counter-opening had also been made, but he gradually grew worse, the temperature remaining low, and he died on December 10th. The post-mortem showed acute tuberculosis of the lungs. The right lung studded with recent pneumonic-looking tubercle, compressed down towards the root, leaving a large cavity. No fluid occupied the cavity of the chest at this time; old tubercle was found at the left apex.

CASE 53. *Right empyema; aspiration; incision; facial erysipelas; meningitis of right hemisphere; death.*—Henry W—, æt. 23, admitted under Dr. Moxon February 26th, 1874; died March 17th, 1874. Family history good. Twelve days before admission he was seized with pain in the right side and rigors. On admission the chest was resonant in front, and there was only moderate dulness behind at the base, with diminished breath sounds; no rub. Temp. 103°. The temperature kept very high, 104·6° to 105°, without any evidence of pneumonia. Aconite was given, but without effect. On March 7th it is noted that the fluid in the chest gravitated according to the position of the patient. There is deep-toned resonance in front with metallic sounds and *bruit d'airain*. The temperature is still high. 10th.—Pneumatic aspiration. Sixteen and a half ounces of sweet pus removed—

site not stated. 11th.—Chest laid open freely by 1½-inch incision in ninth space, near the angle of the scapula. Both after tapping yesterday and incising to-day a good deal of troublesome cough came on for a short time. The temperature fell from 101·4° morning to 99° evening, the pulse from 112 to 105, but the respiration rose from 33 to 40. After this the chest was washed out daily with Lot. Pot. Permang. The pus became offensive the day after incision, and continued so. The temperature quickly rose again, and he got erysipelas of the face, from which he died. The inspection was made by Dr. Hilton Fagge. The right pleura contained puriform fluid and air; there was a free incision into it. The costal and pulmonary membranes were covered with a layer of greyish purulent lymph, everywhere granular on the surface, but not distinctly tubercular. The right lung was completely airless from compression. About its centre some of the tubes were full of viscid pus. At the base were a large number of tubercles, some transparent, others yellow and cheesy. There were also numbers towards the anterior edge of the lung, but not at the apex. None of them were softening, and no basis was found for the supposition that the empyema and pneumothorax were due to tubercular perforation. The left lung was generally emphysematous; it appeared to contain no tubercle whatever. Just at the end of the ileum there were two yellow cheesy grains in the submucous tissue.

CASE 71. *Left pleuritic effusion, at first serous, then purulent; aspiration; incision; death.*—Fanny N—, æt. 1½, was admitted to the Evelina Hospital under my care, when taking charge of Dr. Baxter's cases last autumn. Its ailment began with measles and whooping-cough when five months old. She had been attending as an out-patient with bronchitis for three weeks, and became worse on October 29th, her breathing being much shorter. She was a very pale, thin child, the breathing rapid, features slightly livid, strength exhausted. The left chest was absolutely dull in front, but the left vertebral groove gave considerable resonance with distant breath sounds. The respiration on the other side was puerile. Temperature 101°. An exploratory puncture was made in the eighth space, near the angle of the ribs, but behind it as far back as was con-

sidered prudent. I had expected pus, but clear serum was withdrawn ; six ounces were removed by the aspirator. With the fluid came a large quantity of air in bubbles, so that the contents of the exhausted jar were half froth. There was no trace of blood. It was thought that the air might be sucked in at the joint of the instrument, but this could hardly have been so, for directly the trocar was withdrawn the air rushed along it into the jar with an audible whiz. Moreover, the aspirator worked well in removing the fluid. Both these facts showed the perfection of the instrument, and I think the air must have come from the lung, and have been due to the suction action exercised upon its surface by the aspirator ; but it must be admitted that this explanation is not quite satisfactory, seeing that no symptoms of pneumothorax followed. The chest was much more resonant after the operation, and the breath sounds louder all over the chest, but still bronchial in tone. The heart came back to its natural position from the epigastrium ; there was, in fact, much relief, and this continued. On the sixth night she again became much distressed, and Mr. Paley again aspirated, removing this time 4 oz., again with considerable relief. She took her food well, and seemed comfortable. Six days later she was tapped again (aspirated), four ounces of pus being removed, and five days after it was found necessary to incise the chest at the seat of the former puncture, as the temperature was rising a little and the child's condition was deteriorating. Ten ounces of offensive pus were removed. The child is wasting, though it still takes food well. The whole of the front of the left chest is dull except just at the apex. The breath sounds are feeble and distant, and the heart still beats most forcibly in the epigastrium. The temperature is now 98°. From this time it gradually emaciated, and died on December 12th, 1876, six weeks after its admission.

The post-mortem was made by Mr. Paley, and I was present. The body was emaciated. On examining the chest the left lung was much collapsed, adherent to the chest wall behind from the apex to the base, and outwards to the angles of the ribs. Thence the lung lay quite collapsed near the spine and covered with a thick tough pleura. Sections sank directly in water. The chest cavity contained what appeared to be a large

quantity of pus, but it was really only $1\frac{1}{2}$ oz., thick and rather offensive. The opening made by the incision was patent, but far above the pus line and very small, so that the fluid could hardly have escaped well, supposing it had been below the pus level. The rib was necrosed. There was no excess of granulation tissue on the parietal pleura.

This would have been a good case for cutting out a piece of the rib. The right lung was bulging a little over the median line, and was emphysematous at its edges. There was no pneumonia on either side. The heart was not displaced. No trace of tubercle anywhere. Spleen, liver, kidneys, and peritoneum normal. Head not examined.

CASE 41 (reported by Mr. Thomas Duke, M.A.).—*Right empyema; incision; retraction of the chest.*—Susan P—, æt. 21, was admitted under Dr. Wilks, on October 13th, 1875, and discharged May 5th, 1876. Her father died of hæmoptysis at 45. Eleven months ago she caught cold and had pain in her side, and once since that time she has had considerable hæmoptysis. She was admitted with empyema on the right side, pointing beneath the right breast, the chest being dull all over this side and the vesicular murmur absent below the third rib. The heart was heard to beat half an inch external to the left nipple, but as there was also evidence of some mitral constriction the heart may have been enlarged rather than displaced. The urine contained no albumen. The temperature was $100\cdot6^{\circ}$. The chest was incised at the seat of pointing, a catheter passed in and then cut down upon behind. A drainage tube was passed in at one opening and out at the other, and the pleural cavity was syringed out daily. The tube was removed from the anterior opening on the sixth day and from the posterior on the twenty-fourth day. From that time her general health improved and she gained flesh. Both sinuses still continued to discharge, sometimes more, sometimes less, and were doing so at the time she left. The right side of the chest was then much flattened in front. The resonance fair, but impaired when contrasted with the other side. The murmur distant but vesicular. During her stay she had frequent attacks of fever and rigors, and her urine, though never albuminous, was persistently of low specific gravity, 1008 to 1010.

The left apex was not above suspicion, the respiration being harsh in quality and the expiratory murmur prolonged. There was never anything more than this.

CASE 74. *Empyema ; abscess in the lung ; paracentesis thoracis ; incision ; death.*—Charles W—, æt. 21, was admitted under Dr. Hilton Fagge, May 22nd, 1876, and died June 18th. His family history was not good, and he himself had always been delicate, with winter cough. He was in his usual health till April 14th, when he caught cold by getting his feet wet in the snow. Since then he has had violent cough, the sputum streaked with blood ; and just before admission, after violent coughing, a copious discharge of thin fœtid purulent matter came from his mouth and nose so as nearly to choke him. No breath sounds could be heard on the right side ; the resonance was impaired, and the side expanded badly. Later on succussion was obtained. The breath was very fœtid at times, and dyspnœa urgent. The chest was tapped on June 2nd, and then incised. One opening was made near the angle of the scapula, the other in the seventh space towards the axilla. Horribly fœtid pus escaped. He was much relieved at the time, but became gradually exhausted and died a fortnight afterwards. The base of the lung was adherent to the chest wall and coated with lymph. The lung had two large ulcers in it, one in the middle, the other posteriorly in the lower lobe, which was collapsed and hardly more than a bag of pus. The left base was also in a state of pneumonia and partial collapse. The bronchial tubes were dilated and contained pus. No tubercle was found anywhere.

CASE 40. *Left empyema of old date ; spontaneous opening ; incision of sinuses and division of the rib to procure free discharge ; amyloid viscera.*—William N—, æt. 20, admitted into Dr. Wilks' ward December 8th, 1875, and discharged March 3rd, 1876. He had not felt well for thirteen months, and twelve months ago an abscess opened near the left nipple ; another opened two months after, and a third lately ; all these have discharged profusely. He was in bed five months. He is fairly developed ; the left side slightly flat, not much retracted. There is nearly complete dulness posteriorly on

the left side, and the breathing is distant and bronchial. There is also bronchial breathing at the apex and in the left lateral region of the thorax. The expiratory murmur is also very bronchial on the right side. On February 1st, chloroform being given, Mr. Bryant laid two of the sinuses into one, and by so doing exposed the sixth rib. It was intended to remove a piece of it, but on sawing through it with a Hey's saw the two ends gaped so much that it was unnecessary to do any more. Pus came out in large quantity. The discharge lessened after this considerably, but his spleen and liver became enlarged. He left the hospital in this condition, but much improved in general health.

γ. Cases treated by Paracentesis.

CASE 6. *Left empyema; paracentesis; well.*—Frances K—, æt. 12, admitted under Dr. Pavy, September 27th, 1869, and discharged on January 23rd, 1870. Sharp pain in the side came on after getting wet three weeks before. Her left side was dull all over, the heart pushed to the right of the sternum, and the vesicular murmur was absent. Notwithstanding this evidence of a considerable amount of fluid, this side measured $1\frac{1}{2}$ inches less than the sound side, being $12\frac{1}{4}$ inches to $13\frac{3}{4}$ on the other. No active treatment was adopted till October 25th, when, as fluid appeared to be pointing in the fifth space, lateral region, paracentesis was performed, and a considerable quantity of pus removed. The chest had filled again by November 2nd, when the chest was tapped a second time, and a catheter was put in. It was removed a few days afterwards, and the chest subsequently syringed out. This state of things lasted for two months longer, when the cavity had nearly closed. On January 22nd Dr. Fagge records that the lung had greatly recovered itself, but the respiration was still feeble. Great deformity of the chest existed, the front being flat, the back narrow. The heart was nearly in its place.

The point of interest about this case is the presence of retraction of the diseased side instead of bulging, notwithstanding the existence of a considerable amount of fluid in it.

I have seen a similar case once or twice, and one might suppose that it indicated some old disease of the retracted side. The facts in this case at any rate do not warrant any such diagnosis, and it is more probably explained by some intra-thoracic accommodation of one part to another, the sound side by displacement of the mediastinum relieving the affected one of some of its contents.

CASE 7. *Left empyema; paracentesis twice; well.*—Charles S—, æt. 28, admitted under Dr. Moxon, June 7th, and discharged June 19th, 1871. At the end of 1869 he had inflammation of the lung. In May, 1870, Mr. Hilton tapped the chest and let out nine pints of translucent green fluid. He left June 13th, 1870, and has felt well ever since, but latterly he has fallen off again. On admission, the left lung is dull all over, and rather flat in front. No vesicular murmur. The heart displaced to the right of sternum. June 13th, paracentesis, $5\frac{1}{2}$ pints of yellowish non-transparent fluid drawn off. The heart came back partially, and resonance returned on the left side. He went home feeling well; the heart behind the sternum. Respiration good to the inferior angle of the scapula, gradually becoming inaudible below. Succussion splash audible. The lengthy duration of this case without any great deterioration of health, and the slight amount of distress compared with the large quantity of fluid make it one of considerable rarity.

CASE 21. *Right empyema; paracentesis; spontaneous opening; well.*—Ellen B—, æt. 9, admitted into the Evelina Hospital under Dr. Douglas Powell's care, November 29th, 1869. She had been ill twelve days with pain in her side. There was marked bulging of the right side below the nipple, the right chest measuring one inch more than the left. She was tapped on December 8th by the syphon apparatus, with Dr. Douglas Powell's dynamometer attached, but nothing came. A larger trocar was therefore passed, and a very little thick pus was seen on its withdrawal. The wound healed, but opened again sixteen days afterwards, and discharged freely for some six weeks. She left convalescent, February 24th, the side being still dull, with bronchial breathing all over.

CASE 51. *Left pleurisy; empyema; thoracentesis; death.*—Bridget H—, æt. 30, was admitted under Dr. Habershon, October 6th, 1874, and died November 25th. She had always had good health till twenty-nine days before, when she got her feet wet and did not change. She woke up in the night with sharp pain in the left side. There was evidence of much fluid in the pleura, which was thought to be serous, as the temperature was normal. Six pints of sero-purulent fluid were drawn off by the aspirator, the last few ounces containing blood. No air was admitted during the operation. The cough became more troublesome afterwards, and bronchial breathing was heard down to the sixth rib in front on the left side; behind there was partial resonance as far as the angle of the scapula. No splash on succussion. Heart now behind sternum; it was much displaced to the right before. The patient miscarried with a five months' foetus a week later, and was much exhausted afterwards; as she recovered a little, signs of pneumothorax developed, and she died exhausted, the temperature never rising much above the normal. The left chest was full of a dirty brown pus. The lung quite collapsed, and adherent to the chest wall. Two openings were found in the pleura, one in the chest wall just above the diaphragm, where a small abscess had formed; another in the lung elsewhere. The lung was quite free from any trace of tubercle. Right lung rather bulky, and considerably displaced to the right. Tough recent adhesions of the surfaces of the pericardium, with two local abscesses in them.

CASE 58. *Albuminuria after scarlatina; right empyema; paracentesis; incision; death.*—Henry M—, æt. 18, was admitted under Dr. Wilks, March 16th, 1870, and died October 27th. He was tapped with a trocar on April 28th, and 62 oz. of pus removed. Again on May 2nd 60½ oz. were drawn off, and he left July 21st. He was readmitted on August 19th, and on September 8th, as the empyema was pointing between the eleventh and twelfth ribs on the right side, 5½ pints of thick foetid pus were removed by incision. He died exhausted. The post-mortem was made by Dr. Moxon. The right chest was contracted and that shoulder depressed. The right pleura was moderately thickened and in a state of long-standing inflam-

mation, its cavity containing air and about 4 oz. of pus. The lung was adherent to the front of the chest and flattened, so as to be quite airless. It was tough and greenish-black in colour, with no suppuration of the texture. The outer thickened layer of the pleura had given way at three or four points, and hernial protrusion of the lung had occurred.

CASE 59. *Right empyema; paracentesis four times; death.*—Ambrose L—, æt. 24, a carman, was admitted under Dr. Wilks, January 3rd, and died March 1st, 1868. He had enjoyed good health till November, 1866. Since then he has had cough, and his breath has been getting shorter and shorter; no particular local pain. He was well developed, but suffered from general anasarca, moderate ascites and clubbed fingers. The heart was normal; urine 1027, not albuminous. He was tapped on January 25th, 64 oz. of laudable pus being removed. On January 23rd 70 oz., on February 1st 110 oz., and on February 20th 90 oz. were removed. On February 29th, the last note states, "There is very free discharge. He complains of a feeling of sinking. Pulse 134." He died on March 1st. At the post-mortem, made by Dr. Moxon, the right chest contained 165 oz. of pus, pushing the organs over to the left side across the spine, so that a deep space or groove was seen on that side of the spine, the viscera of the right chest being packed in the right third of the left chest. Two cavities were found in the apex of this lung, but no tubercle, and the pleura also was free from tubercle. The hinder part of the lung about the centre of the lower lobe showed a depression underneath which was a cavity with some cheesy tubercle in it, which may have been the cause of the empyema. There were no tubercles near it. There was acute suppurative peritonitis, but the contents of the pleura and peritoneum did not correspond, and no communication between the two cavities existed.

CASE 63. *Left empyema.*—Catherine C—, æt. 6, was admitted to the Evelina Hospital under Dr. Playfair, July 6th, 1870. She was taken with scarlatina five weeks ago, from which she appears to have recovered in a fortnight. Then she had dropsy, which quickly subsided, and the present cough

and feeble condition ensued. There is but little movement of the left chest. The intercostal spaces remain distended during inspiration, with dulness all over, absence of respiration, and bronchial breathing. Vocal vibration absent on the left side, and ægophony is present. There is some coarse respiration with crepitation at the right base. The heart is displaced to the right of the sternum. T. 101.4° . No albumen in the urine. July 8th, Morning T. 100° ; evening T. 101.2° ; P. 160. Respiration almost entirely abdominal. Percussion now impaired on right side also. No difference in the measurement of the two halves of the chest; some slight convulsions during the night. At 5 p.m. 3ss of thin purulent serum was withdrawn by the aspirator, and is said to have been followed by great exhaustion two hours later. July 9th, T. 100.2° . Too ill for examination. July 10th to 14th, temp. remained at 100° , after this it was normal, or rather below. The heart occupied the median line, the apex being in the normal position, but the right side was extremely distended, while the left was normal. The left pleura full of thick pus. The corresponding lung completely collapsed, and covered by a soft greenish-yellow layer of lymph. Recent lymph at the right base. Some collapse of upper and middle lobes. The remainder fairly crepitant. All other parts healthy; no enlarged glands; no lardaceous change.

δ. *Cases in which no Surgical Treatment was adopted.*

CASE 44. *Right empyema; double pleurisy; death.*—Albert R—, æt. 21, was admitted under the care of the late Dr. Barlow, on October 3rd, 1866, and died twelve days afterwards. Three weeks before he had got wet through, and a week later symptoms of acute pleurisy in the right side supervened. He had orthopnoea, immobility of the lower two thirds of the thoracic wall of the right chest, and corresponding dulness. The heart's action became irregular, and he died. The post-mortem revealed a large empyema rather at the front than the back of the lung under considerable tension. The heart was displaced to the left and the lung carnified. The left pleura

was covered by lymph, and the lung diminished in size from external pressure. No tubercle in any of the viscera.

CASE 46 (reported by Mr. H. Duke, M.B.). *Left pleurisy and effusion ; empyema ; pericarditis ; death.*—William L—, æt. 29, was admitted under the care of Dr. Moxon March 10th, and died March 15th, 1875. One sister died of consumption. He has been a free drinker. Three weeks ago he caught cold, and had shifting pain in the chest. He wasted rapidly, sweated much, and had copious expectoration with “bronchitic sputa.” He has been delirious the last few days. The left chest is dull all over, hardly moves at all ; respiration absent. The præcordial dulness extends $2\frac{1}{2}$ inches to the right of the sternum, and pulsation can be seen and felt in the epigastrium. Liver extends an inch below the ribs. Spleen normal. Urine 1015, copious albuminous deposit. T. 98.6° ; P. 92 ; R. 32. He became so distressed that in the evening he was tapped with a large trocar just below the angle of the scapula ; 112 oz. of pus were withdrawn, and a drainage tube was left in. This the patient, but little improved by the operation, pulled out the same evening. Nothing more was done, as he still remained delirious, and died on the 15th. The heart was apparently still displaced, but less so than before he was tapped. Both lungs contained thickened septa, and the left was somewhat compressed by a quantity of pus. No tubercle. The larynx was ulcerated and the glands about the pancreas were caseous.

CASE 48 (reported by Mr. Pickering). *Local empyema, left side ; old and recent consolidation of left lung ; hæmoptysis ; death.*—Richard H—, æt. 55, was admitted under Dr. Moxon’s care August 30th, 1875, and died September 5th. He has had ague. First taken ill ten weeks ago with a pain in his left side, which gradually got worse. He worked for a week and then gave over for three weeks. Has had a cough eight weeks. Six weeks ago he resumed his work ; and a week after, when walking home, he coughed and vomited three pints of blood. He got very faint, but walked on supported by two men. Two weeks ago he had a second attack, but brought up less. He has wasted a good deal. On admission he was rather thin,

a little jaundiced, very weak. The chest did not give any very decided indications, but there appears to have been some dullness at both bases, more decided at the left, and at the latter distant bronchial breathing. Heart's action diffused and feeble; urine 1022, no albumen. Temp. 102.2°. At the post-mortem a localised empyema was found corresponding to the posterior aspect of the lower lobe of the left lung. This lobe was compressed and almost airless. The apex of the left lung was in a state of old hard infiltration, and the middle lobe in a state of grey hepatization. The right lung healthy; no tubercle.

CASE 49 (reported by Mr. W. A. Kidd, M.B.). *Left empyema; pneumonia; peritonitis; tuberculosis.*—Aloysius C—, æt. 4, was admitted under Dr. Taylor, April 8th, and died April 10th, 1875. The child was stated to have been always subject to bruises on slight injury. He is said to have taken plenty of food lately, and to have been quite well till the evening of April 6th, when his breathing was observed to be difficult. He was extremely wasted, with bruises all over him, and a large fluctuating swelling over the sacrum, afterwards found to contain decomposing blood-clot. There was a swelling on the ulna, which ultimately turned out to be a healed fracture, and there was but little doubt that the child had been much neglected. The whole of the left side was dull on percussion, the right being resonant. The breath sounds were decidedly deficient on left side and bronchial near the apex, though they could be heard at all parts. Puerile respiration on right side of chest. At Dr. Taylor's visit next day, there was obviously a good deal of fluid in the left pleura; the heart's position could not be ascertained. There was no distress, and the child did not seem unusually ill, so tapping was deferred. He died rather suddenly at 4 a.m., the respiration becoming quicker, but unaccompanied by any lividity. The post-mortem was made by Dr. Hilton Fagge. The right pleura had a little granular lymph posteriorly. The left contained a large quantity of turbid fluid, the membrane covered with a layer of rather rough lymph; no tubercles. The right lung contained at its apex a cluster of miliary tubercle, and lower down some more; the upper ones caseous, the lower pearly and grey. The greater part of upper lobe of

left lung hepatized and grey, soft and breaking down. The rest of the lung carnified and very tough. Both peritoneum and pericardium contained a purulent fluid. One or two small ulcers in the intestine with hardened edge and running transversely.

CASE 54 (reported by Mr. J. C. Ferrier, M.B.). *Pneumonia; empyema; secondary tuberculosis.*—Henry W—, æt. 23, was admitted under Dr. Wilks, October 17th, 1874, and died June 30th, 1875. He had always enjoyed good health as a labourer in the Borough Market till October 11th, when he was taken with violent shivering, felt very cold yet sweated profusely, and was obliged to take to his bed, which he has kept ever since. On admission he is a strong-looking, well-nourished man; he breathes rapidly and has flushed cheeks. *Chest.*—Dull on the right side as high as the spine of the scapula, with bronchial breathing, broncophony, and increased vocal fremitus. On the left side the breath sounds are increased. He has occasional pain in the right side, but no rub can be heard. The temperature is 104.2° ; resp. 44; pulse 124; urine not albuminous, and containing an abundance of chlorides. The heart is normal. The sputum is viscid and slightly rusty. It subsequently became more copious and frothy, the other physical signs remaining the same. The temperature fell till the 29th, when it is noted as having risen to 103.4° , and the tactile vibration and breath sounds were diminished. His expectoration now began to be excessive, and from this time forward his symptoms were—1st and chiefly, profuse expectoration of greenish phlegm, which towards the end became offensive. 2nd. Fever, which, however, was not excessive. Records of evening temperature are scanty, but it was high when observed. 3rd. Wasting. 4th. Diarrhœa. As the case progressed it is noted that (February 15th) the left apex expands badly, and there is some distant crackling on deep inspiration. The right side is still dull all over, and there is crepitation on deep inspiration, the lung expanding badly. On May 3rd the right side is over-resonant in front, expiration coarse, inspiratory murmur vesicular, increased vocal resonance below the clavicle on the right side; posteriorly the right side gets but little air into it, and there is

crepitation but no bronchial breathing. On the left side there is a good deal of crepitation. He died on June 30th, gradually exhausted by diarrhœa and profuse expectoration. The post-mortem is headed by Dr. Fagge, who made it, "empyema and pneumothorax, pulmonary tuberculosis, scrofulous kidney, lardaceous viscera." The right lung anteriorly was adherent to the chest wall by thin connective-tissue adhesions, except between the fourth and fifth ribs, where a narrow prolongation of the cavity of the empyema reached nearly to the sternum. This cavity occupied the whole outer side of the right chest, and extended backwards to the side of the spine, limited, however, by some partial bands of adhesion. It contained about a pint of thin, dirty-looking pus, which did not fill the space. Some parts of the lung were exposed and roughened in the wall of the cavity by ulceration. The third rib about its middle was discoloured and roughened as well as its head. The left pleura was closed by firm adhesions, which consisted of a thick membrane containing bands of thick yellow material, apparently yellow tubercle, running down in the course of the ribs. Both lungs had their tissue mapped out to an unusual degree by white bands of fibrous tissue. They also contained a large number of grey tubercles scattered singly and in small clusters, not more in one lung than the other, and not more towards the apex or front than the base. The larynx was healthy; the bronchial glands swollen and greyish, but without any caseation. In a single pyramid of one kidney there was an opaque yellowish-white mass of angular outline, which, it seemed, could not be anything but an early stage of scrofulous kidney.

CASE 55. *Right empyema; compression of lung; tubercle of the spleen; death.*—Elizabeth W—, æt. 37, admitted under Dr. Moxon, October 24th, died December 1st, 1874. Four or five years ago she had a fall on her back; followed by an abscess and fistula in ano, which was cured after operation in eight weeks at Cambridge. Two months ago she got wet through, cough and shivering came on and she became ill. She has kept her bed for a month. Nails slightly curved. Right side moved but little; it was flattened, gave a bruit d'airain; amphoric respiration and *increased* resonance. There was also a splash,

and the heart beat a little to the left of the nipple. Urine slightly albuminous; temperature normal. She had diarrhœa and vomiting, and gradually died exhausted without surgical treatment. The post-mortem, made by Dr. Fagge, showed, in addition to the state of the chest, a tubercular affection of the spleen and of the glands near the cæcum, tubercular peritonitis and cirrhosis of the liver. The right pleura was filled with a thin purulent fluid; when this was emptied out it was seen that the lung had not as usual become flattened upon its root; on the contrary, it was fixed by adhesions in several places; part of its lower surface adhered to the diaphragm, forming a kind of fleshy column with a space all round it. On the outer surface it adhered over a broad space to the middle ribs, and at the upper part was drawn out into a conical body adherent by a narrow band of adhesion to the first rib. The pleura itself was not much thickened. It had on it some patches of curdy lymph, but no tubercle. The lung was perfectly airless and hard. It contained no tubercle. Its tubes were full of pus. The left lung was healthy.

CASE 56 (reported by Mr. John Davies). *Right pleurisy; empyema; death.*—Emily E—, æt. 39, a nurse in a surgical ward, was admitted under Dr. Habershon, December 5th, and died December 30th, 1874. She had had a breast tumour removed by Mr. Howse some months back. Two weeks ago severe pains came all over her. She had sore throat, cough, and pain round the mamma. Bronchial breathing, crepitation, and a rub were audible. T. $102\cdot4^{\circ}$, 104° at 9 p.m. December 11th, morning T. 102° , evening $101\cdot8^{\circ}$. No signs of effusion. 12th, T. $102\cdot1^{\circ}$. Bronchial breathing all over the right chest, with a loud rub. These continued throughout the case, and no signs of any large effusion occurred at any time. The right half of the chest was filled with thick yellowish-green, inodorous pus. The right lung lay shrivelled by the side of the spinal column, covered and bound down by a thick pleura, which was covered by butter-like lymph. The lung was quite airless, the bronchia standing out on section. Some of the latter were dilated into thin-walled membranous sacs without any surrounding thickening. They contained pus similar to that in the pleural cavity, but no communication between the

two could be found. The costal pleura was thickened. The left lung was healthy and remarkably free from any œdema or bronchitis. No cancer found.

CASE 57. *Right empyema after confinement; death.*—Elizabeth C—, æt. 24, admitted under Dr. Pavy September 29th, and died October 10th, 1871. No surgical treatment was attempted; she was exceedingly ill, but without evidence of much fluid. The post-mortem, made by Dr. Fagge, showed empyema, pneumonia, abscess in the axilla, and inflammation of the cervix uteri. The right pleura contained a good deal of pus. There were old adhesions of the middle and lateral parts of the lung, so that the organ was unable to shrink back entirely. The parts collapsed were the base, the hinder part and the anterior part, while the apex and some of the central part were not so. This last was œdematous, some of it pneumonic. No tubercle. The pleural sac was lined by a thick false membrane. The base of the left lung was coated by a thin layer of recent lymph. No evidence of any pyæmia, and the axillary abscess did not penetrate towards the chest.

CASE 72. *Left empyema; no treatment; death.*—Abraham H—, 4½ months old, came to my out-patients on May 31st, 1876, with constipation and vomiting. After this it continued to waste, and on June 27th fluid was found at the left base. The left side gave considerable dulness on percussion both back and front, and it was not used so well; the respiration, though vesicular, was distant, and the heart sounds were much louder in the epigastrium and to the right of the sternum than to the left. A week later he was more wasted, and the left side was hardly used at all; the heart was more displaced, and hardly any respiration was heard. He was so ill that it was doubtful if paracentesis would relieve him, there being no distress and merely extreme anæmia, and it seemed probable that he had some tubercular disease at the bottom of the mischief. Nothing was done in the way of operation, and the child died next day. I made the post-mortem two days after at its home. The left chest was full of pus, and towards the base there was a good deal of flaky yellow-green lymph, but the greater part was liquid pus, and

could easily have been removed by tapping. The lower lobe of the lung was quite solid from compression, and covered by a vascular layer of lymph. The upper lobe was much pushed forwards and inwards, so that on removing the sternum it looked like a thymus occupying the anterior mediastinum. The chest was neither excessively full nor bulging, though directly the sternum was removed pus welled out.* There were no adhesions subdividing the cavity. No trace of tubercle. The other lung was healthy. The heart was not much if at all displaced.

An acknowledgment of the ready kindness with which the staff at Guy's and the Evelina Hospital acceded to my request that I might publish their cases will form a fit conclusion to the foregoing details.

HISTORICAL NOTES
ON
BRIGHT'S DISEASE, ADDISON'S DISEASE,
AND
HODGKIN'S DISEASE.

BY SAMUEL WILKS, M.D.

HAVING with some amount of justifiable pride often alluded to the fact that many discoveries in medicine will for ever be associated with the name of Guy's, I have not, at the same time, been unmindful of the suspicion that self-laudation may be a sentiment still lingering in the human breast. I have, in consequence of such feelings, often been led to consider upon what foundation does the fame of the men whose names head this paper rest. For my own part I am far from accrediting many persons because their names are familiar to us with much originality of opinion, believing that in each case the amount of award must vary and be in some measure proportionate to the common knowledge already possessed by others. Being also in accord with Goethe that discoveries are made by the age and not by the individual, I should consider the instances to be exceedingly rare of men who can be said to be living before their age, and to be the repository of knowledge quite foreign to the thought of the time. The rule is that a number of persons are employed at a particular piece of work, but one being a few steps in advance of the others is able to crown the edifice

with his name, or, having the ability to generalise already known facts, may become in time to be regarded as their originator. Therefore it is that one name is remembered whilst those of coequals have long been buried in obscurity. If this be not the case it is difficult to understand how, in one particular month or even week in the history of the world, two men should alight upon the same fact and contend for the priority of discovery. Such a circumstance would be impossible were it not that a number of persons were instituting researches in that direction at the same period of time. For instance, whilst the friends of Adams and Leverrier were discussing the claims of each to the title of discoverer of the planet Neptune, it ought not to have been forgotten that others had already assisted in the work by noting the deviations in the orbit of Uranus. So, again, Virchow and Hughes Bennett could not have disputed about the priority of the discovery of leukæmia had not a host of microscopic workers already been in the field. In this particular case it is remarkable that, though the palm of victory was generally awarded to the German pathologist on account of his supposed more correct interpretation of the morbid appearance of the blood, regarding as he did the white cells as very different from those of pus, which Bennett believed them to be, yet now we are obliged to confess our difficulty in distinguishing these two forms of cells by styling them leucocytes, and even admitting that leukæmia may sometimes have its origin in a suppurative process. I do not know that one is justified in endorsing fully the opinion of De Morgan, who says, "All the men who are now called discoverers in every matter ruled by thought have been men versed in the minds of their predecessors and learned in what had been before them. There is not one exception. I do not say that every man has made direct acquaintance with the whole of his mental ancestry; many have, as I may say, only known their grandfathers by the report of their fathers. But even on this point it is remarkable how many of the greatest names in all departments of knowledge have been real antiquaries in their several subjects."

As regards the diseases mentioned at the head of this paper it may be very safely asserted that most of the leading facts described by Bright were already known, but that he put all these together in so methodical a manner and added to them so

many fresh observations as to justify his contemporaries in asserting that he had placed renal disease on a distinct foundation, and made it for ever recognisable in the nosology as a common complaint. In the same way the disease described by Hodgkin could not have failed to be observed at any period of medical history, but it was reserved for him to unfold it as a special pathological disorder. As regards Addison, however, the novelty of his discovery was complete, for, although cases of melasma of a special form had been met with already, no one had hinted at their association with disease of the suprarenal bodies; and if any further proof were wanting of this statement, it is to be found in the scepticism with which almost up to the present day the discovery has been received, whilst there was a ready acceptance of the almost contemporaneous announcement of Bright because it was quite in accordance with the knowledge of the time.

With regard to BRIGHT, the impression which the perusal of his works has always made upon me may be considered to be an extraordinary one when I say that he did not perceive the true value of his own observations. If this be so, Bright must have been endowed with a mind of most exceptional character, since according to the dictum of Ruskin, which I should fully endorse, there are a hundred persons who can think to one who can see or observe.

It would follow, therefore, that it is an easier task for a man to sit in his study and write about medicine than to walk through the wards and observe facts for himself. This idea I believe to be absolutely true, and it might be illustrated by such an example as pyrexia, of which our present knowledge can be comprised in a few pages, whilst in former times the writings on fever elaborated out of the brain filled numerous volumes and formed the basis of doctrines on which schools of medicine were founded. Bright could not theorise, and fortunately gave us no doctrines and no "views," but he could see, and we are struck with astonishment at his powers of observation, as he photographed pictures of disease for the study of posterity. He related in several large volumes what he himself saw, and if there be any sign of a predilection for one class of malady rather than another it is for brain disease, but he rarely offered

any theoretical opinions, and, therefore, it may justly be inferred that he had none and probably did not thoroughly perceive the value of his own work.

There seems, indeed, reason to believe that he attached no more importance to the diseases of the kidney than to those of the liver or brain which he also described, and, therefore, that the merit of discerning where his originality lay, was left to his readers rather than to himself. It is probably known that Bright described a case of supra-renal disease with discoloration of the skin; the symptoms of *Morbus Addisonii* were perfect, and the specimen now in our museum shows the typical form of the morbid alteration which takes place in the organs. The case only needed the attention of some shrewd observer to bestow on Bright the credit of another discovery, and so by forestalling Addison to have enabled him to carry off double honours. I might also allude, in connection with Bright's marvellous power of observation, to the fact that he was one of the first who described acute yellow atrophy of the liver, pigmentation of the brain in miasmatic melanæmia, condensation of the lung in whooping-cough, unilateral convulsion without loss of consciousness in local cerebral diseases. He was also the first, I believe, who noted the bruit in chorea, and he made also many other original clinical observations. I am not aware of any drawing previous to his which pictured small bodies, evidently echinococci, on the interior of hydatid cysts. I cannot, therefore, but regard many observations of Bright as more novel and original at the time of their publication than those relating to the kidney, but the latter were of more value and their greater significance at once recognised. It is remarkable that a great many of the facts connected with renal disease were already known, but it remained for Bright to put all these together and associate them with a morbid change in the kidney, so that, indeed, his discovery known as Bright's disease was almost equivalent to a discovery of kidney disease. I would by no means assert that any one could be said to have an acquaintance with a disease who knew nothing of its nature (but this was not the case with Morgagni or Blackhall), for a dropsical person could not have escaped notice at any period of the world's history, and Horace himself must have seen a case of albuminuria when he sang—

"Crescit indulgens sibi dirus hydrops,
Nec sitim pellit, nisi causa morbi
Fugerit venis, et aquosus albo
Corpore languor."

Blackhall wrote his treatise on dropsy in 1813, fourteen years before the publication of Bright's 'Medical Reports,' in 1827. In this work he gives many cases of dropsy in which the urine was albuminous, and if he had taken care to pass from the ward to the post-mortem room and had described the state of the kidneys in the fatal cases, he would have gone far to deprive Bright of his present fame. But in this pursuit of pathology lay Bright's great merit, for it would almost seem that before his time (in this country at least) a body might be examined and the kidneys remain untouched. But we cannot give credit even to Blackhall for the discovery of albuminous urine, for he himself speaks of having seen a case under his master, Dr. Latham, in 1795, where the urine was rendered coagulable by heat and nitric acid. And even prior to this Erasmus Darwin tells us in his 'Zoonomia' that the fact was known to Cotunnus about the year 1750. The latter had a patient who voided a great quantity of urine which coagulated like white of egg. In the year, too, previous to the publication of Blackhall's work, a paper was read at the Royal Medical and Chirurgical Society by Dr. Willis on the dropsy following scarlatina in which serum was said to be contained in the urine. But it must have been long prior to any of the periods just named that Morgagni was interested in the question. In alluding to conflicting opinions as to the nature of milky urine he says, "The controversy alluded to was carried on at Padua; and at Venice there was another dispute to determine whether or not blood was combined with the urine of a certain abbot, for none subsided even when it had long been kept. On being consulted I persuaded the disputants to institute the experiment of applying fire, assured that if blood should be contained in the urine by this means it would coagulate. This experiment at once terminated the discussion." There seems, then, to have been a pretty general knowledge of the fact that serum of the blood might pass into the urine and be recognised by its coagulation, and also that this condition was associated with dropsy. The intimacy between the renal secretion and

anasarca also must have been known, for Van Swieten says if the urine be increased in quantity the body wastes, if lessened it swells.

Bright's great merit was the discovery of distinct pathological changes in the kidney in connection with dropsy and albuminous urine; of course it was impossible that no thought had been given to the kidney, and Blackhall in two other cases did examine the bodies of his patients, and it is clear that he met with diseased kidneys, but had not the faculty to further examine their nature; for example, he says in one case, "kidneys remarkably small and sound, if we except two or three hydatids of the size of a garden pea in the cortical part." It was impossible that the Italian physicians who devoted themselves to morbid anatomy could have overlooked disease in the kidneys, and there is, in fact, mention of it several times. Valsalva, it may be remembered, was born in 1666, and Morgagni in 1682. They were professors at Padua, and Valsalva was a pupil of Malpighi. Morgagni did not publish his treatise until he was very old, and he, the father of morbid anatomy, continued his work and his lectures until he was ninety years of age—a consolatory thought to those who spend many hours in the atmosphere of the post-mortem room. Morgagni described in a general way all forms of atrophy of the kidney; he knew of its arrested function and of the symptoms which necessarily followed. He gives many instances of patients who had a suppression of urine, accompanied by vomiting and convulsions. In one place he says, "The detention of a large proportion of urinary matter in the blood at length proved fatal, though it was deposited in other parts, especially into the abdominal cavity, for this excrementitious fluid readily blends itself with other secretions. In the person of the preceptor Natali, Malpighi found one of the ureters and the corresponding kidney surprisingly dilated from the urine being intercepted by a calculus. The retention, which in the end proved fatal, lasted many days, and the patient observed that his saliva had both the odour and flavour of urine, and he perceived that the halitus transpiring through the skin possessed the same urinous character.

"Albertini informed me that the noble youth the structure of whose kidney has been described by Malpighi in the letter to

Sponius, not only spat saliva which had the taste and smell of urine, but the colour as well as the flavour and odour demonstrated that it was little else than urine. Perhaps it was in consequence of the discharge that he lived so long until, the suppression being overcome, he voided a great quantity of water. It happened to this patient, however, as it often does to others, that in consequence of the viscera and humours being vitiated by the protracted retention of urine, death soon afterwards took place." The same author describes many cases of this kind, and in some of them alludes to the kidney; as for example: "The kidneys were very small and were uneven on their surface owing to hemispherical protuberances. Their substance was more compact than usual, and the pelvis of one of them contained a little turbid serum."

I think it may, therefore, be safely said that dropsy must have been recognised as long as man has been seen to succumb to mortal disease, and also that for more than a century the urine was known to be albuminous in certain forms of this complaint; and for as long a period that persons died with symptoms of uræmia where the kidneys were small and granular. It is clear, however, that renal disease was not recognised as an important malady until Bright's essays appeared, or he would not have been hailed at once as a discoverer and the malady called after his name. He systematised and placed the disease on a satisfactory foundation, which was equivalent to having discovered it. He first showed there was a common form of disease amongst us which was to be recognised by certain definite methods, and more than this, that there were varieties of it. In this the merit of his discovery seems to consist.

As regards ADDISON, I have just now said that there can be no doubt about the originality of his work, although he was much assisted by those who felt an interest in it, and who urged him to make known his discovery. It may reasonably be asserted, as in the case of renal dropsy, that patients having this remarkable malady could not fail to be observed, and therefore it is not unlikely that we occasionally meet with cases of Addison's disease in old works under various other appellations. It was certainly remarkable that Bright not only described

the clinical features of a case of the kind, but afterwards dissected the body and placed the capsules in the museum. The patient was a young woman who had an abscess in the breast; at the same time it was observed that she had a very dark complexion, and had constant vomiting. The morbid appearances found in the body were slight, with the exception of disease of the supra-renal capsules, which was called scrofulous suppuration. Bright gives no hint of his having any suspicion that in these organs lay the *fons et origo mali* of the remarkable case he had witnessed. Another author, however, came still nearer to the discovery, although he did not alight upon the disease in the capsules. Seeing that he had an unrecognised complaint to deal with, he described most minutely the clinical features which we now call Addison's disease, but he failed, owing to a careless dissection, to discover the seat of the abscess to which he rightly attributed the symptoms. He believed this to be in the pancreas, but there can be no doubt with our present light that it was in the capsule. Addison's treatise on disease of the supra-renal capsules was dated 1855, and in the year 1846 Dr. F. A. Aran published in the 'Archives Générales' some cases of supposed pancreatic disease, one of which is detailed very fully; the main features are the following, and are quite sufficient to indicate the true nature of the malady which he had before him. A woman entered the Hôpital de la Charité under Cruveilhier in the year 1846. She was 25 years of age, was married, but had no children. The history was that, four years before, she began to complain of rheumatic pains in her chest and back, which prevented her lying on her back. After some months she was cured of these troubles, and remained pretty well until a year before admission, when she began to ail in various ways, with a feeling of fatigue, lassitude, and sickness occurring without any cause. At the same time she perceived that her skin, which was naturally white, was turning yellow, until her neck, body, and limbs were all affected. The colour became more intense, and in eight months was the colour of bistre, with here and there small specks of a dark brown on the surface. She continued at work until three and a half months before admission to the hospital, when she was seized with a pain in the back and stomach with frequent vomiting. All these symptoms continued until her

admission, with increasing darkening of the skin, so that she looked like a mulatto, and at the same time had great loss of power and wasting.

On admission she was seen to be a woman of moderate size, thin, with her skin the colour of a mulatto, of a yellowish-brown, more pronounced in some parts than others, as over the joints and backs of the hands, while the legs were less dark than the arms; the face was of an olive colour and the conjunctivæ perfectly white. A close physical examination of the chest failed to discover any organic disease. At the end of a week without any apparent cause she was much worse, complaining of feeling very ill and of general fatigue and sickness. The latter continued without intermission, the pulse became very feeble, and she died in the night without any one being aware of it.

Post-mortem examination.—The skin was examined and the discoloration found to be due to an augmentation of the normal pigment in the Malpighian layers. On opening the abdomen and lifting up the liver two or three spoonfuls of pus escaped; this was thick, yellow, and grumous, and seemed to come from the neighbourhood of the cardia. A further dissection took place in order to find the exact seat of the abscess; the stomach was clearly not its source, but it had contracted adhesions with the pancreas. The coeliac glands were augmented in volume, softened and infiltrated with a black matter, and those near the pancreas were filled with granular and tubercular matter. The pancreas had in its left half or tail an abscess, and around it matter like soft cheese. There was no disease in any other organ except a few cretaceous deposits in the lungs. No mention is made of the spine.

I think there cannot be the slightest doubt that this case was one of Addison's disease, and the seat of the cheesy matter and pus was the supra-renal capsule. It is also possible that the disease was associated with caries of the spine, as several cases have been recorded of the combination of the two affections. Dr. Aran alludes to other cases of pancreatic disease, but in none of them was there discoloration of the skin, and yet he has no hesitation in associating these two conditions together. He believed that he had arrived at a remarkable fact, but could afford no explanation of it. In much the same language as

Addison used he asks, "Ces faits sont-ils suffisants pour qu'on puisse se prononcer avec assurance sur la nature des causes qui ont déterminé la coloration anormale de la peau? Nous ne le pensons pas; et maintenant verrons-nous dans cette coloration anormale une simple coïncidence, ou bien l'influence d'une action sympathique inconnue exercée par le pancréas? C'est là, nous l'avouons, une vue purement spéculative et qui paraît même assez bizarre, si l'on se rapporte aux fonctions que le pancréas est censé remplir dans l'économie; mais qui nous dit que toutes ses fonctions nous soient parfaitement connues? Sans doute cette influence et son mode d'action seraient fort difficile à comprendre. Mais combien de faits aussi difficiles à comprendre sont acceptés aujourd'hui sans conteste? C'est donc une question à réserver entière et dont la solution se fera peut-être attendre longtemps."

No fault can be found with this reasoning of M. Aran, for the same would be perfectly applicable to the facts which Addison discovered. The former failed from want of accurate dissection, and that he was wrong in associating the discoloration with the pancreas is shown by there being no further corroboration of it after thirty years, whereas its connection with the capsules was immediately proved to be correct by independent observations in all parts of the world. We can imagine that the merest accident, such as the assistance of an intelligent colleague, might have enabled him to fix upon the true focus of the abscess which he found, and this single case would then have been the starting-point for a further research, and Addison would have been anticipated by ten years. When I say ten years, I refer to the date of the publication of his treatise, but it was five years prior to this that Addison was enabled to lay the matter before a local medical society. So little attention, however, was given to the novel statements there made, that his friends urged upon him at a subsequent period the publication of his volume. In the 'Medical Gazette' of March 15th, 1849, will be found the report of a meeting of the South London Medical Society, at which Addison read a paper on anæmia and disease of the supra-renal capsules. After giving a clinical description of the cases the author said, "In three cases only was there an inspection of the body after death, and in *all of them was found a diseased condition of the supra-*

renal capsules" (the italics are in the original). "In two of the cases no disease whatever could be detected in any other part of the body. Dr. Addison inquired if it were possible for all this to be merely accidental? It might be so, but he thought not; and making every allowance for the bias and prejudice inseparable from the hope or vanity of an original discovery, he confessed that he felt it very difficult to be persuaded that it was so. On the contrary, he could not help entertaining a very strong impression that these hitherto mysterious bodies—the supra-renal capsules—may be directly or indirectly concerned in sanguification; and that a diseased condition of them, structural or functional, may interfere with the elaboration of the body generally, or of the red particles more especially. At all events he considered the time had arrived when he felt himself warranted in directing the attention of the profession to these curious facts." I think it is clear that at that time Addison had not distinguished the supra-renal complaint from fatal anæmia, and even in the preface to his treatise he spoke of the two maladies in conjunction. He was in the habit of seeing persons fade away without his being able to discover any striking morbid appearances in their bodies after death, but sometimes he met with disease of the capsules. It seemed to require a further development of the subject for him to connect the discovery of the latter with discoloration of the skin. It is evident from the report just quoted that Addison's mind was for some years somewhat confused as to the relation of these two diseases.

Addison styled the disease "*melasma suprarenale*," and I am under the impression that the term "bronzed skin" was first used by Mr. Hutchinson, to whom Addison always felt indebted for the earnest manner in which he set about substantiating the author's statements. I am not aware that the translation of his term into "*cutis ænea*" has been recognised as the appropriate expression by the profession, or whether it is Mr. Oliver Wendell Holmes' invention for his own private use; but the readers of the 'Poet at the Breakfast Table' will remember the following consultation over a case of Addison's disease where the term is adopted. The poet has a discoloration on the forehead and goes to consult Dr. Franklin, when the following dialogue ensues:

“‘The colour reminds me,’ said Dr. Franklin, ‘of what I have seen in a case of Addison’s disease, *Morbus Addisonii*.’

“‘I said I thought the author of the ‘Spectator’ was afflicted with a dropsy to which persons of sedentary and bibacious habits are liable.’

“‘The author of the ‘Spectator’!’ cried out Dr. Franklin; ‘I mean the celebrated Dr. Addison, the inventor, I would say, discoverer of the wonderful new disease called after him.’

“‘And what may this valuable invention or discovery consist in?’ I asked, for I was anxious to know the nature of the gift which this benefactor of the race had bestowed upon us.

“‘A most interesting affection, and rare too. Allow me to look closely at that discoloration once more for a moment. *Cutis ænea*—bronze skin they call it sometimes—extraordinary pigmentation; a little more to the light if you please. Ah! now I get the bronze-colouring admirably, beautifully. Would you have any objection to showing your case to the societies of medical improvement and medical observation?’

“‘May I ask if any vital organ is commonly involved in this interesting complaint?’ I said faintly.

“‘Well, sir,’ the young doctor replied, ‘there is an organ which is—sometimes—a little—touched I may say; a very curious and—ingenious little organ or pair of organs. Did you ever hear of the *capsulæ suprarenales*?’

“‘No,’ said I, ‘is it a mortal complaint?’ getting nervous.

“‘It isn’t a complaint—I mean they are not a complaint; they are two small organs, as I said, inside of you, and nobody knows what is the use of them. The most curious thing is that when anything is the matter with them, you turn of the colour of bronze. After all I didn’t mean to say I believed it *Morbus Addisonii*; I only thought of that when I saw the discoloration.’

“‘So he gave me a recipe which I took care to put where it could do no hurt to anybody, and I paid him his fee (which he took with the air of a man in the receipt of a great income), and said good morning.’”

As regards HODGKIN it must be remembered that he was a man of eminent scientific ability and of great literary attainments. His severance from the hospital at an early age brought his more purely scientific work to an end, an event

ever to be deplored by Guy's and the profession at large. He made a great many original observations and placed in our museum numerous curious specimens of which he did not perceive the true nature, such as syphilitic, lardaceous, and several other forms of morbid changes. The subject of lymphadenoma was discussed in an essay brought by him before the Royal Medical and Chirurgical Society in the year 1832, and the cases which illustrated it had been under notice during the previous ten years. The paper, which is to be found in the seventeenth volume of the 'Transactions,' is entitled "On Some Morbid Appearances of the Absorbent Glands and Spleen." He therein describes the disease now known as lymphadenoma, and that it is the same as the modern one may be proved by examining the specimens, which illustrated his essay, now standing on our museum shelves. Of course it cannot for a moment be imagined that so striking a form of disease had escaped observation, and already, shortly before, Carswell had mentioned a case of glandular disease which he had seen in one of the Paris hospitals, and which he had styled cerebriform. Dr. Hodgkin seemed fully aware that such cases could not possibly be overlooked, and in his opening remarks states his reasons for bringing them before the Society, which it may be observed are exactly those which I have adopted for terming it a discovery; that is, he saw that this enlargement of the glands was a peculiar pathological condition which required separation from cancer, tubercle, and other already recognised morbid states. He says, "The morbid alterations of structure which I am about to describe are possibly familiar to many practical morbid anatomists, since they can scarcely have failed to have fallen under their observation in the course of cadaveric inspection. They have not, as far as I am aware, been made the subject of special attention, on which account I am induced to bring forward a few cases in which they have occurred to myself." Hodgkin, no doubt, was right in believing that such cases of disease must have been observed; indeed, no one could be long in practice before meeting with an example of it. In that mine of wealth, Morgagni's 'Morbid Anatomy,' a case is related of a lad, fifteen years of age, who had had for several years large glands in the neck and axilla, and after death similar ones were found

in the chest and abdomen. The remarkable fact remains that in spite of Hodgkin's advocacy of the claim of this disease to be regarded as a new pathological entity, it had not penetrated into the text-books of medicine or surgery, and I take credit to myself for having unearthed Hodgkin's paper and introduced it to the profession. So little, however, was this paper known to me when I took some examples of this glandular disease to the Pathological Society nearly twenty years ago, and so unacquainted were the members at that time with it, that it was received as a novelty, and the '*Lancet*,' alluding to the fact, said, "Much interest had been evinced amongst the profession by the announcement of Dr. Wilks at one of the meetings of the Pathological Society during its past session that the morbid specimens which he exhibited were taken from a patient whose disease was new and hitherto unnamed;" and a foreign journal spoke of it in the same terms. It was not, therefore, impossible that I might have been fathered with the discovery had I not shortly afterwards alighted on Hodgkin's essay, and so saved the profession from a name even more uncouth than *morbus Hodgkini*—a patronymic which I must confess to have myself conferred upon the malady now known by the kindlier appellation of lymphadenoma.

My object has been to speak merely of those diseases known by the names of the three distinguished men whom we have been noticing, but some of the same remarks are applicable to many other forms of malady which have become associated with names of modern times although clearly described at long anterior dates. The method, however, has no doubt been the correct one, of connecting the disease with that man who has the most thoroughly elucidated its nature. I might illustrate this by the very recent pathological knowledge of visceral syphilis and lardaceous disease; and yet specimens of these morbid conditions had long been exhibited on the shelves of museums and their characters vaguely described. Examples of lardaceous liver may be found in our museum at least fifty years old; one of them, a very excellent specimen described in the catalogue by Dr. Hodgkin, in 1829, as coming from a lad long bedridden from caries of the spine. He says the liver was very large, rounded, hard and dry, and cut like a ham. He

had observed the same appearance in those who had taken mercury. But even older than this is an account of a case by Dr. Blackhall, which as far as it goes is perfect.

A woman, æt. 32, was in the hospital in 1810. She was very intemperate, had had syphilis, and been through the mercurial course. She passed urine in considerable quantity, as much as two quarts every night and one quart a day, which was coagulable by heat. She also had caries of the skull and of the tibia. After death the liver was found very large and hard, unusually weighty and solid; when cut, firmly resisting the knife and resembling incipient scirrhus; the edges were blunt, rounded, and thick. The kidneys were remarkably solid and hard as if approaching somewhat to scirrhus.

In the same way specimens of syphilitic nodules in the liver had been preserved although their nature was not known. Morgagni says that he had found disease in every organ of the body of those who had venereal disease, but apart from puckering and adhesions no distinct account is given of gummata in the liver. As regards the skull and brain he relates more than one instance; as for example, that of a woman who had been affected with the venereal disease, and died after having suffered much from delirium and pains in the head. He found the bones of the skull, the membranes, and the brain firmly adherent to one another.

In the case of another woman who had two syphilitic tumours on the head and had taken mercury, Morgagni says that "before the use of the mercury she had been the subject of epilepsy, and had only had one epileptic attack during the mercurial treatment, and when the tumour had subsided she was harassed with convulsions. She then lay in a state of coma some days before death. The bone was found quite destroyed at one part, and the brain covered with a membrane as thick as pasteboard, and the cortical substance beneath it as firm as the texture of liver; the other portions were soft." Morgagni does not question that the induration was due to syphilis, and he adds "that the brain has been found not only indurated but scirrhus in cases of epilepsy." There can scarcely be a doubt that this great morbid anatomist recognised gummata as the result of syphilis and the cause of epilepsy.

The foregoing observations may tend to show both to those who hold extravagant views as to the merits of the so-called discoverers, as well as to those who are pleased to disparage their claim, that after all the credit due to them must be variable and comparative. In some instances the men of fame have done little more than collect together the facts already before them; in other instances they have simply completed the edifice by the addition of some new material, whilst the fabric has been built up by the labour of their predecessors; or again in other cases they have by a power of intelligence been able to put an interpretation upon facts which had previously stared us in the face without a meaning. As regards the three men whose work is under discussion we are reasonably proud of them at Guy's, and it cannot be denied that their names will be handed down amongst the most illustrious of our profession. It may be, however, that some centuries hence they will be remembered especially in connection with those diseases which are designated by their names, and yet at the present time, and amongst ourselves, these constitute but a very small portion of the work which made them distinguished at our school. I have already said that Bright's papers on the kidney constituted only a portion of his writings, and to those who knew Addison, it is almost absurd to rest his fame on a discovery made towards the close of his career, and when his clinical teaching had reached its end. To his pupils the essay on supra-renal disease is nothing compared with what he did during a long series of years in the elucidation of the forms of phthisis and some other diseases. It was not a mere scientific discovery but his powerful lectures which impressed the last generation of Guy's men. Whilst to us his work on supra-renal disease is a trifle, to the outside world and to posterity it may be that which will perpetuate his fame. Again, with Hodgkin, it is probable that the association of his name with the glandular disease may assist in the extension of his posthumous fame abroad, but to us the accidental discovery of his paper on the subject added but little to the estimation in which he was already held.

In thus declaring how fortuitous is fame in distributing her favours, we must admit that our instincts guide us rightly when we stamp the name of an individual on a new fact or event, although we may have only the vaguest idea of their especial connection.

TWO CASES
OF
SUBCUTANEOUS OSTEOTOMY OF THE
NECK OF THE FEMUR.

BY C. H. GOLDING-BIRD, B.A., M.B.

CASE 1 (from the report of Mr. Chubb).—F. Q—, æt. 20, by trade a brushmaker, was admitted into Naaman Ward on October 27th, 1875, under the care of Mr. Golding-Bird, for ankylosis of the right hip after disease of that joint.

His family history is good, and the patient, though a spare man, enjoys good health, but he finds that the angle at which his thigh is now placed with regard to the trunk, and the necessity for always walking with a crutch, seriously impede him in gaining his livelihood.

In 1863, and again in 1864, he was in the hospital under Mr. Poland and Mr. Hilton for hip disease, and when he was discharged he walked on crutches, but after a time he discarded one of these and began to wear a thick-soled boot.

Present condition.—The right lower limb is much shorter than the left, and very wasted. The right thigh is bent to nearly a right angle on the trunk, and somewhat adducted. In this position it is fixed, yet on careful manipulation very slight movement can be detected in the hip, showing the ankylosis to be fibrous. The great trochanter and neck of

the femur are represented by a mass of bone, over which the skin is in one spot very thin and cicatricial, and the scars of several old sinuses are visible. The position of the mass of bone that represents the trochanter is, as compared with the opposite side, upwards and backwards, showing displacement of the femur on to the dorsum ilii. The knee is moveable, but always carried flexed. The whole shortening of the limb amounts to about two inches. There is considerable lordosis in the lumbar region, and the muscles and fascia lata, both in front and in the outer side of the thigh, can be felt as tight cords beneath the skin.

The patient is now completely crippled. He walks by the help of a crutch and high boot, and though he leans over considerably towards the affected side he can but bring the toes of the right foot to the ground. He complains much of pain along the front and on the side of the thigh, and especially about the insertion of the tensor vaginæ femoris. It was both on account of the pain and because he found it so difficult to carry on his work, having to hobble about his workshop with a crutch, that he first sought advice.

30th.—Ordered a mixture of iron and quinine.

Nov. 9th.—The patient was placed under chloroform, and an attempt was made by Mr. Golding-Bird to bring down the thigh by force. This failed, so he divided subcutaneously the rectus femoris, sartorius, tensor vaginæ femoris, adductor longus, and whatever else seemed to offer opposition. This also failing, Adams's operation was performed. A puncture was made from above on the inner side of the great trochanter with a straight bistoury, and the soft parts down to what represented the neck of the thigh were divided subcutaneously. Adams's saw was then introduced, and the section of the bone commenced; it was completed in forty minutes, the mass of bone proving to be considerably thicker and of greater density than had been anticipated. The thigh was then fully extended and a pad of lint was strapped over the wound; a long outside splint (Liston's) was applied.

10th.—Extension by weights applied.

11th.—Weights removed on account of the great pain the extension caused. Temp. 99°; pulse 88.

12th.—Temp. 98°; pulse 84.

13th.—Temp. 101° ; pulse 120. Bowels confined. Complains much of pain about the hip. Ordered a purge, and—

R Quiniæ Disulph. gr. ij,
Liq. Morphiæ mv ,
Mist. Quiniæ zj , t. d. s.

15th.—No pain. Feels very easy. Temp. 101° ; pulse 132.

16th.—Temp. 100.5° ; pulse 104. Slight extension by weights applied.

18th.—Temp. 98.8° ; pulse 96. Additional extension employed.

19th.—No discharge from the wound. It has been dressed daily with carbolic oil. There was at first a slight discharge of pus, until a small fragment of bone had come away. A bedsore had formed over one of the old cicatrices.

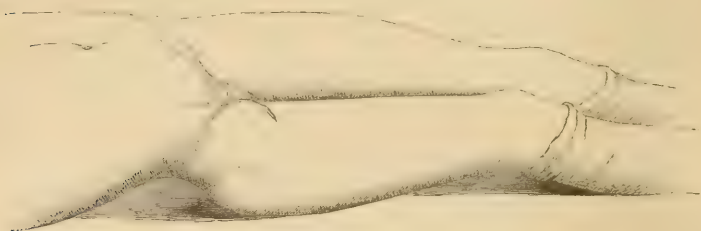
The further progress of the case may be thus summarised :—By December 20th the bedsore had healed, but the outside splint and extension were retained until January 26th, 1876, when a “Bavarian” spica bandage was applied, the patient at that time ceasing to complain of all pain and tenderness on manipulation. A few days later he was allowed to get up, and soon walked about the ward on crutches, and was discharged on February 19th. His condition on that day was as follows :—Right leg, from anterior superior iliac spine to internal malleolus, 28 inches, left leg, $32\frac{1}{2}$. The parts around the hip appeared more thickened than before the operation. He can stand without support, but walks only with crutches. He sits with comfort, and when seated scarcely any difference is discernible between the two sides. He can flex the right thigh to 45° with the pelvis, and can rotate it slightly outwards.

The patient was next seen on April 15th. He had worn a high boot for the last month, and could walk about without any assistance, but when out of doors carried a walking stick “as a precaution.” The joint that had resulted from the operation was nearly stiff, but he had resumed his work as a brushmaker with far greater ease than before.

In January, 1877, the patient again presented himself. The joint was perfectly fixed with the limb in a straight line. He could do all that could be expected of a man with an ankylosed hip and a leg two inches shorter than that of the

opposite side. When standing erect, with both legs parallel, it was noticed that a slight degree of lordosis still existed.

The accompanying woodcut shows the appearance of the patient when lying flat on the couch, fourteen months after the operation.



CASE 2 (from the report of Mr. C. H. Downes).—Charles M—, æt. 23, was admitted into Lazarus Ward, under Mr. Golding-Bird, on September 27th, 1876. Family history good, and he has always enjoyed good health.

Ten years ago he fell down with his legs apart and injured his right hip. He was taken to a medical man, who told him there was nothing the matter, and that he would “grow out of it.” The patient, however, states that his thigh was then fixed in a flexed position (even more so than at present), and that for some time he was obliged to walk about on his hands and knees. By degrees he was able to lift himself from this position, and to go about, supporting his body by grasping the right thigh with his right hand, and later still he was able to walk with a stick, and to carry the upper part of his body erect, by considerably arching his back in the lumbar region.

On admission there is but slight difference in the nourishment of the two legs, and the right femur is the same length as the left, measuring from the trochanter major to the condyles. The right thigh is fixed at an angle of 45° with a perpendicular erected upon the anterior spine of the ilium, and no movement independent of the pelvis can be obtained. When standing the limb is nearly in the position of a dislocation into the sciatic notch, and the great trochanter is nearer the crest of the ilium and higher up than on the left side; Nélaton's line also falls below it. The upper part of the femur appears to be

normal in every way save position, and, owing to the somewhat wasted condition of the soft parts around, the finger can easily be inserted into the digital fossa; from this point the neck appears to run backwards and inwards. The knee can be flexed or extended, and has not suffered from being carried in the semiflexed position during so long a time.

Oct. 10th.—Chloroform having been administered, Mr. Golding-Bird proceeded to divide the neck of the femur subcutaneously with a chisel. The digital fossa being felt for, a narrow knife was thrust through the tissues on its inner side, in the direction in which the neck was presumed to be. At the depth of two inches the bone was struck, and a "carver's" chisel was introduced; the neck of the femur was then nearly divided by blows of a mallet close to its junction with the shaft; by extension the remainder was fractured. Before the limb could be completely brought down, subcutaneous division of the fascia lata and some muscles was performed. The operation was completed in eleven minutes.

The patient was placed in double outside long splints, and extension was applied to the right limb by means of an india-rubber door-spring.

11th.—Temperature 100.4° ; pulse 60. Only slight extension employed, as the patient complains much of pain.

12th.—Temp. 99.8° ; pulse 60.

13th.—Temp. 99.4° ; pulse 69; no particular pain. A Liston's splint applied, with extension by weights.

14th.—Temp. 100.2° ; pulse 68.

16th.—Temp. 98.6° ; pulse 65.

17th.—Extension increased this morning, and a sand bag was placed over the knee to keep down the thigh, which had become slightly flexed.

25th.—The splint was removed; the patient could bear a certain degree of manipulation without pain, but pressure on the sole of the foot or over the trochanter caused pain. The thigh could be flexed to only a slight degree independently of the pelvis. Lordosis much less marked than before the operation.

The remaining points of any interest are:—On November 22nd a leather spica was fitted, and by the second week in December the patient was walking about the ward on crutches.

On his discharge, January 3rd, 1877, the right limb measured $31\frac{1}{2}$ in., and the left $32\frac{1}{2}$ in., so that a small piece of wood glued on to the sole of his boot permitted of his walking evenly. There was no movement of the thigh independently of the pelvis, and the lordosis still remained, though only in a slight degree.

Jan. 20th.—I saw the patient before his departure for a convalescent home. He was walking well on both feet with the aid of crutches; he could stand alone, but could not walk without some support.

The lithographic plate represents this patient's condition both before and three months after the operation.

The first of these cases is a fortunate instance of the results of successful osteotomy, and the second, as far as can be seen at present, will, in the end, be not inferior to it. Examined in detail they present very marked contrasts both in the causes of the original deformity and the methods of treatment adopted; and as in one the saw and in the other the chisel was used, a few remarks upon the relative value of these two instruments in osteotomy as illustrated by these cases will not be out of place.

In Case 1 disease of the hip-joint in early life was the cause of the ankylosis, but the bad position in which the limb came to be placed was but the result of neglect on the patient's part after his discharge from hospital in 1864. Judging from the number of scars there had been much suppurative action, and so great had been the after-development of new bone that not a normal point was to be made out. The great trochanter was but a large mass of bone, adherent in one part to an overlying cicatrix. The neck of the femur cannot be said to have existed, it being represented by a short but thickened piece of bone, hard to be defined, in the midst of the indurated soft parts that surrounded it.

Had division of the femur below the great trochanter with the chisel at that time been recommended I should most probably have employed it, but Adams's operation with the saw was the recognised method of treating these cases, and so no alternative was left between sawing the neck or leaving the case alone.

One argument for the division of the femur below the trochanter in these cases is that in operating through the neck in close proximity to the original seat of disease a risk is incurred of starting inflammatory action afresh. This might be the case where any representative of a joint or any synovial membrane remains, or where a short time has elapsed since the primary disease, but as none of these conditions were present in this patient there was nothing to be feared in operating where I did.

An objection to division of the shaft of the femur instead of the neck is that union must of necessity take place at a considerable angle, while the amount of shortening will in all probability be greater, the nature of the tissues around offering but little obstruction to the full play of the muscles upon the lower fragment, while if the neck be divided, especially if matting from disease has taken place around, much shortening from displacement becomes almost an impossibility.

The thickness of the bone that had to be encountered gave more trouble than was expected; and the long time during which the saw was being used was afterwards partly explained by the density of the bone, as proved by a fragment that eventually came away from the wound.

The operation need not be described—it is familiar to all; but in this particular case I tenotomised first of all in the hope that, as the union was fibrous, it might be made to yield to force, and so the necessity for dividing the bone be obviated.

Case 2.—The local conditions in this case were very different to those that existed in the former one. The displacement of the femur was the result of accident and not of disease, and so the surrounding soft parts were normal, though rather wasted. Although when the patient was standing erect the position of the limb was that of dislocation into the sciatic notch, and although the neck as far as could be ascertained seemed to be of normal length, yet it is probable that some fracture had been sustained, for bony ankylosis is not likely to have resulted from a simple displacement. The digital fossa could be easily recognised, and the finger inserted into it, owing to the atrophy of the

muscles, and the direction of the neck was backwards and inwards.

The operation in its preliminaries resembled Adams's, but the chisel being inserted into the wound instead of the saw, it is driven by a mallet through the bone in whatever direction it is desired. The operation is now one of simple carpenter's work, and the surgeon who knows how to use a chisel would here apply his general knowledge both to obviate locking of the tool or to release it if so fixed. Working in the dark as it is, great caution is needed to avoid leaving the track first made; for if a fresh incision into the bone is commenced a wedge-shaped fragment will certainly be cut off and be a source of future trouble. Mr. Adams has objected to the use of the chisel in operating on the neck of the femur, on the ground that so smooth a surface cannot be obtained as with the saw, and that therefore there is less likelihood of a moveable joint being obtained.

Further on I shall state my reasons for preferring the chisel, and with regard to obtaining a moveable joint, I had no idea of such a felicitous result. My first case had a joint fairly moveable for a short time, but on the shrinking of the newly-formed fibrous tissue it became as stiff as it was before, and this I imagine is the result of nearly all false hip-joints thus formed.

In obtaining or attempting to obtain a moveable joint the patient must be anæsthetised in order that passive motion may be employed, while always extension to the full must be kept up, which means constant pain and irritation ill borne by cachectic patients. Considering, therefore, that the operation was not one of necessity, but rather of convenience, I did not feel justified in subjecting my patients to the above-mentioned risks in order to obtain a doubtful and temporary benefit. This class of patient is sure to have some shortening of the limb and therefore a limp, and considering the great mobility that has previously been developed in the lower lumbar and sacro-iliac joints acting "vicariously" for the hip, a moveable false joint will not materially improve their gait, while, when seated, none but a professional eye would detect anything amiss.

When the section of the bone was all but completed and the

remainder had been forcibly fractured, the limb could not be brought down straight until several muscles and the fascia lata had been subcutaneously divided. Though possibly continued extension might without this have eventually stretched the muscles and fasciæ, I thought it better to divide them at once than put any extra demand upon the patient's powers of endurance; while at the same time it had the advantage of paralysing some of the muscles that tended to draw up the lower fragment.

The after-treatment of both cases was alike; the horizontal posture and moderate extension were maintained as far as possible, and before being allowed to get up a firm spica was applied to give additional support. Pain on manipulation of the part in both cases did not last long, but that which pressure on the foot upwards produced was the last to vanish, and its disappearance was my guide as to the time when I first allowed the patient to get up and attempt to support himself in the erect position.

In Case 1 some suppuration came from the puncture, but it ceased on the discharge of a small fragment of dense bone; in Case 2 the wound closed at once and gave no trouble at all.

Though it was difficult to judge accurately of the length of the affected limbs prior to their being placed straight, yet in neither does it seem that any appreciable shortening occurred as the result of the division of the bone. In the first case this may be explained by the firm, cicatricial, and unyielding nature of the tissue around, while the muscles were so wasted that but little extension was able to overcome them; in the second, the bone not being completely cut through, the part that was broken, and that was, therefore, irregular, may have had something to do with it.

In both cases a slight degree of lordosis in the lumbar region persists, but it can be made to disappear on the patient's lying down and raising both thighs; and though considerably less than before the operation I cannot find in Case 1 that it has at all improved since the patient's discharge from the hospital fourteen months ago. Its persistence points to some structural change in the vertebral column during the years that the deformity had existed.

To my mind there are several reasons for preferring the chisel to the saw, and I cannot think of any circumstance under which a surgeon could be called upon to perform subcutaneous osteotomy where he could not use the chisel, and that with advantage. To attempt to give an opinion on the worth of instruments from but two cases would be presumptuous, but to come to a fair conclusion needs almost more mechanical than surgical knowledge, and so one's general experience may be appealed to, it being premised that there is no surgeon who is not a carpenter.

In order to employ a saw subcutaneously it is necessary that the bone is well covered, or, at least, not subcutaneous like the tibia, and that sufficient room be provided for its application at the point where the section has to be made. In the case of the hip-joint, were the neck of the femur normal in all respects and surrounded by a sound capsule, any further separation of parts after once entering the capsule would scarcely be necessary, but since it is on a once diseased structure that the operation is generally performed a complete separation of the soft parts must be first made unless they are to be lacerated by the saw.

In the close neighbourhood of large vessels or nerves it might be impossible to find room for the saw to work without danger, where, I believe, a chisel might advantageously be employed. An instance of this may be found in the shoulder-joint. When ankylosed I do not think it possible, or hardly so, to use the saw at the point of junction of the humerus and scapula, nor do I know of any case where it has been attempted, the surgical neck being chosen as the seat of operation. An interesting case of this kind has just been recorded by Mr. Adams;¹ the operator, an American surgeon, sawing through the surgical neck, and the patient recovered with a fairly useful new joint. The reason for not dividing the anatomical neck is not stated, but I presume it was scarcely considered feasible on account of the proximity of the axillary vessels. Might it not have been safely cut through from behind with a chisel? Although the result of the case referred to was highly satisfactory, yet could the false joint have been formed in a plane parallel with (if not in the

¹ 'Brit. Med. Journal,' Jan. 20th, 1877.

actual site of) the old one, more movement might have been obtained from it than from one acting in a plane at right angles to the normal articulation.

The saw also gives rise to a great deal of detritus which may become a source of irritation and of suppuration, as in my case; and if of suppuration perhaps also of something worse, and so it is worth avoiding.

The necessary to-and-fro movement, even if so carefully managed as to avoid laceration, at least favours the admission of air to the bone, and so destroys the idea contained in, and thus may fail in obtaining the benefit of, *subcutaneous* osteotomy.

The section made by the saw is said to be smoother than that with the chisel, at least to present no splinters. Provided a chisel is really sharp and of a good temper and handled with reasonable care, I believe in the live bone that a perfectly clean section may be made; I have employed it to divide the os calcis instead of using the saw, and a perfectly level surface was obtained. Mr. Annandale, of Edinburgh, speaks highly of the chisel in resections, and especially in that of the ankle; the articular surfaces can be sliced off without the necessity of thoroughly exposing the bones to apply to the saw.

To obtain the best results the chisel must be no ordinary one, but one of hard steel with a keen edge, and to lessen the chances of locking should, as Mr. Maunder recommends, be ground equally on both sides (a carver's chisel).

Volkman's method was to employ chisels of three different sizes, commencing with the smallest, by this means hoping to prevent locking. I do not myself see the necessity for this, while the changing of the instruments during the operation is likely to give rise to trouble. One of average breadth (four tenths of an inch) is the one I made use of.

If it be desired to employ the chisel in the continuity of a long bone, say in lieu of refracture, no further separation of the soft parts would be necessary than to carry the instrument on to the surface of the bone, and from that one spot all that is required of it may be done with facility.

The question of the chisel *versus* the saw in these operations is after all no exception to the general rule, that the surgeon finds that instrument best in the use of which he is the most skilled; but whichever he may employ, the good result

of having given a cripple the use of his limb again will fully justify his choice, and he will have the satisfaction of having added another to the rapidly increasing number of successful cases of subcutaneous osteotomy.



SOME CASES

ILLUSTRATIVE OF THE

DIAGNOSIS OF DISEASE OF THE CÆCUM.

BY S. O. HABERSHON, M.D.

THE diagnosis of disease of the cæcum is often attended with difficulty, and there are numerous points of interest and importance that require our careful consideration in order to recognise the characters of the complaint. The right treatment of the disease is so essentially connected with a correct diagnosis that we cannot over-estimate the importance of thoroughly making out its true nature; in one class of cases purgative medicines may be indicated, and may prove the means of cure; in another the effect of aperient medicine is disastrous and may take away the patient's chance of recovery.

Several of the cases which have come under my care in the wards of Guy's Hospital very well illustrate some facts connected with this subject. We would premise that the cæcum may be affected with—

1. Distension from faecal accumulation.
2. Inflammation of its coats, typhlitis.
3. Inflammation of its external parts, perityphlitis.
4. Ulceration, in phthisis, in fever, in dysentery.
5. Obstruction, ulceration, and perforation of the appendix.
6. Cancerous disease.
7. Intussusception.

Disease of adjoining structures and sympathy with the

viscera in the immediate proximity to the cæcum may obscure the diagnosis :

Disease in the iliac fossa and of the sacro-iliac synchondrosis.

Disease of the kidney ; calculus and pyelitis.

Disease of the ovary.

Abscess in the parietes.

Disease of the glands, iliac and lumbar.

Aneurism.

In reference to these latter forms of disease several instances are narrated, and although it may seem when the full narrative is given that the diagnosis is an easy one, such is not the case at an early stage of the complaint.

1. Distension.—Simple distension of the bowel may produce severe pain in the region of the cæcum, with dulness on percussion and ill-defined fulness ; there may be pain in the loin and down the thigh, sometimes with nausea, and even vomiting, probably because the transverse colon is also distended. This state is, however, free from local abdominal tenderness or febrile disturbance ; and it is often effectually relieved by gentle aperients and by enemata. The distension of the bowel with pain may, however, be secondary to obstruction of the colon at the sigmoid flexure or other part, and in such cases the locality of the pain is an uncertain guide to the seat of disease.

2. When the coats of the bowel become inflamed the tenderness is greatly increased ; the mucous membrane becomes congested, its secretion is altered, the muscular coat is also affected, and then the peritoneal serous membrane. It is this condition which is known by the term typhlitis ; there is dulness at the part, great tenderness and pain, the bowels are confined, there is febrile heat, the pulse is quickened, the bladder often sympathises and micturition becomes difficult. This state is often mistaken for perityphlitis, but it is only the coats of the bowel that are involved, the surrounding tissues remaining perfectly free. If purgatives are given the pain is increased, the bowels do not act, or if from the potency of the remedy action is induced, the evacuation consists often of fluid faecal matter, which passes around a hard faecal mass which is left behind ; vomiting may also be

produced, and in many cases peritonitis is set up or is greatly aggravated. It is in this condition that muscular movements and purgatives are exceedingly detrimental. The patient ought to be kept perfectly at rest in bed, the bowel should be allowed to be quiet, and opiates or morphia administered, while warm poultices are applied externally.

A typical case of this form of disease lately occurred in Guy's under my care, and will illustrate the value of perfect rest and the avoidance of all aperients for many days. The patient was not allowed to be moved from her bed, and but little food was given. The dulness in these cases arises principally from fæcal accumulation, and it is some time before the bowel becomes free; the coats of the bowel are also thickened and this doubtless increases the dulness on percussion and the sensation of hardness on manipulation.

CASE 1. *Typhlitis* (reported by Mr. A. B. Hammond).—Sarah A. M—, æt. 20, was admitted December 27th, 1876, into Guy's Hospital under my care; her father and brother had died of phthisis. On Wednesday, December 20th, whilst doing her work as a collar dresser, she was suddenly seized with severe pain in the stomach, and in half an hour the pain became of a griping character, accompanied by severe sickness and purging. She went home to bed, and hot poultices were applied; the purging soon subsided, but the sickness and pain continued till admission. The patient was short, thin, and pale. The abdomen was rather tense, and she suffered from severe pain in the region of the cæcum, where an enlargement could be felt about the size of a cocoa nut. The resonance at this part was imperfect, and the abdominal muscles were fixed. The tongue was moist, but had a whitish fur; there was thirst; no appetite; vomiting came on if food was taken. The pulse was 130, temperature 103°. The heart and lungs were healthy. She was directed to remain perfectly quiet in bed, and one grain of opium was given every four hours; poultices were applied to the abdomen.

The following day she was free from pain, and there was scarcely any sickness; the pulse was 108 and the temperature 98·8°.

On January 1st the abdomen was less tense and more

resonant, the patient was free from pain and looked more cheerful ; there had been no action of the bowels ; temperature 97.8° , pulse 100. The same treatment of perfect rest with opium was continued.

On the 6th, ten days after admission, as she complained of forcing pain in the rectum, a simple enema was used which relieved the bowels ; fish was now allowed, and the opium given night and morning. The fulness in the cæcum had considerably lessened.

On the 13th the bowels acted twice without any enema ; the patient expressed herself as well, and the opium was discontinued ; a little thickening in the cæcal region could be felt on deep pressure, but it had already disappeared on January 23rd, when she left the hospital well.

3. Inflammation of the external cellular tissue, especially behind the cæcum and in the iliac fossa, is a more severe form of disease, and often leads to fatal symptoms. The mischief may commence in the cæcum, and by extension of inflammation lead to this external disease, or there may be perforation of the bowel and extension of the disease into the cellular tissue. In the former case the clinical history is that of cæcal disease, as typhlitis first ; in the latter the onset is sudden, as in perforation from ulceration of the appendix cæci, or in phthisis. These instances are obscure and insidious in their onset. If the mischief remain in the iliac fossa, there may be the effusion of inflammatory product, and thickening of greater or less duration, persisting perhaps for months. If suppuration ensue, and an abscess forms, it extends in various directions, either inwards, opening into the bowel, when a discharge of pus may relieve the symptoms, or outwards, it may reach the skin in the groin and be there discharged ; sometimes it passes upwards behind the ascending colon or downwards into the pelvis, and in some cases the abscess opens into the rectum.

The following cases well illustrate the characters of perityphlitis :

CASE 2. Perforation of appendix cæci ; abscess behind the ascending colon reopening into the colon ; clot in the vena portæ ; pus in the mesenteric vein ; pyæmia.—Georgina D—, æt.

23, was admitted into Guy's on December 29th, 1875. She was a married woman, but had not had any children. Four months previous to admission she had had a miscarriage. Her general health was good, and her illness began three weeks before admission, with severe pain in the back, and with diarrhœa and vomiting. When brought to the hospital she had an anxious expression of countenance, was wasted, and appeared to suffer pain. She lay on her back, with the legs drawn up; the tongue was dry; the teeth and gums covered with sordes; bowels loose, and the motions fluid and of a yellow colour. The hepatic dulness was increased, and there was much tenderness on pressure; the pulse was small and compressible, 140; temperature $102\cdot6^{\circ}$; respiration 30; there were no maculæ observed. A little crepitation was audible at the bases of the lungs, but otherwise they were healthy. The heart was healthy. About forty ounces of urine were drawn off, sp. gr. 1010; it contained a slight trace of albumen and chlorides in diminished quantity. The patient moaned from pain, but appeared in a soporose state; the pupils were normal; she had not suffered from any rigor.

On the following day she was in the same state, but on the 31st she had rigor and vomiting; the previous evening there was constant diarrhœa, with vomiting and retching; temperature 100° ; pulse 130; respiration 44.

On January 1st she was still in great pain, and the diarrhœa returned; motions of an ochre colour and loose; pulse 140, weak and fluttering; there were flatulent eructations, and again vomiting. She complained of severe pain about the heart, and great restlessness preceded death; she remained sensible till near her death at 6 p.m.

On examination the appendix cæci was quite divided about an inch from the intestine, and it opened into a sloughy abscess, which extended behind the bowel; the abscess opened into the ascending colon by a round aperture about the size of a sixpence. There was no tubercle in the lung nor in the intestine, and no other ulceration in the intestine; there was no evidence of enteric fever, nor of any foreign body having lodged in the bowel.

The mesenteric vein contained pus. The vena portæ continued a clot, which had formed in a double layer upon the

coats of the vein, and had allowed some blood to pass along the centre of the vessel. There were numerous peripheral abscesses of small size in the liver; the spleen was healthy, and also the kidneys.

The diagnosis of this case was extremely obscure when the patient was brought into the hospital; it was evident that there was acute disease of the abdomen, with peritonitis, but how it had originated was not clear; there had been diarrhœa, but there was no proof of enteric fever, nor was there evidence of phthisis or tubercular disease. Insidious disease of the appendix led to ulceration, then to suppuration behind the cæcum, and a second opening formed into the bowel at the ascending colon. Suppuration then extended into one of the branches of the mesenteric vein, and led to the obstruction in the vena portæ and to the abscesses in the liver. The pyæmia was the cause of the later symptoms and of death.

This case may be contrasted with one more recently under my care in Guy's, in which equal obscurity attended the diagnosis. There was acute inflammatory disease in the region of the cæcum, but in this instance the cæcum was pushed aside from its normal position, and the disease in the iliac fossa was produced by perforation of the termination of the ileum, perhaps from enteric fever (Case 4).

CASE 2. *Tuberculosis; ulceration of the ileum; ulceration of the cæcum; perforation; abscess behind the ascending colon; old hydatid in the liver*¹ (reported by Mr. H. A. Latimer). — Thomas A. T—, æt. 54, was admitted under Dr. Habershon's care on April 4th, 1871. He had resided at Hackney, and had been employed as a tea warehouseman. He had formerly drunk freely of beer, but he became a teetotaller in 1855. Till three years previously his general health had been good, but he then had an attack of pleurisy on the left side. He was ill for two or three months, but afterwards went to work, and continued at his employment till twelve weeks before admission. For at least twelve months he had been complaining of pain in the right side in the region of the liver, and he had been unable to hold himself upright in consequence of the pain.

¹ Read at the Medical Society.

When quite young he had a fall from a horse, and antero-posterior spinal curvature in the dorsal region was produced. He had also suffered from double hernia, for which he wore a truss.

Some weeks before admission he was seized with more severe pain on the right side, and there was enlargement in the region of the right hypochondrium. The practitioner in attendance regarded the disease as hepatic abscess, and his opinion was confirmed by the discharge of pus from the bowel and the subsidence of the swelling.

On April 2nd vomiting and purging came on, and continued till admission on the 4th. He had emaciated rapidly before being brought to the hospital. He was then pale and anæmic; he was free from pain when perfectly quiet, but pain came on when he was moved; it was located in the right hypochondrium. He was very sick, and vomited almost every ten minutes, all food being at once rejected. He complained of faintness. The left leg was enormously swollen and distended, the veins were very much enlarged, and there were some petechial blotches below the knee. The leg began to swell on April 2nd, and attained its great size in an hour and a half. It was very painful when touched or moved. The right leg was of natural size and free from pain. On pressure in the right hypochondrium a distinct nodular hardness could be felt, and fulness and tenderness extended to the iliac region; the rectus muscle was rigid. The tongue had a yellowish fur upon it. The pulse was 126, very small, and feeble. The heart and lungs did not present any signs of disease. The urine had a specific gravity of 1016, and was very albuminous. The left leg was wrapped in cotton-wool, and a cradle was placed over it. Brandy was allowed.

When admitted the patient seemed almost in a dying state. The vomiting, however, ceased, and he rallied.

On the 8th the temperature was 97.4° , the pulse 103; he felt stronger and more comfortable, and there was freedom from sickness. There was still much uneasiness on the right side. The sedative mixture of bismuth (Guy's) was ordered.

On the 15th opium and belladonna were given to remove pain and sickness, which again distressed him, and they afforded relief to those symptoms.

On the 25th he complained of great weakness; a rounded swelling of great density could be felt in the liver; the mouth was aphthous and ulcerated. Borax and honey were ordered.

On the 26th the left leg had nearly regained its natural size. The right leg, however, became suddenly swollen as the left had been, and the patient soon sank, but was sensible till nearly the close.

Inspection was made on the 27th. There were extensive old pleuritic adhesions; the lungs contained an excess of fibrous tissue; there were numerous scattered tubercles, and a few small cavities filled with pus. The heart was healthy, and the stomach also. There were numerous tubercular ulcers scattered through the ileum. These were most frequent and largest near the cæcum; and there was tubercular deposit on the peritoneal surface of the intestine beneath the ulcer. The appendix cæci was healthy, but the cæcum was perforated by ulceration close to its base. The perforation opened into a faecal abscess, which extended behind the colon upwards to the under side of the liver. There had been chronic peritonitis, and the colon had become glued to the peritoneal walls. In the liver, which was rather fatty, there were two old hydatid cysts filled with calcareous substance; one of these, about the size of a small hen's egg, was superficial, and had been felt during life. The mesenteric glands were much enlarged, but did not contain any cancerous product. Hooklets of the echinococcus were detected in the fluid from the cysts. The spleen was healthy. The kidneys were fatty and rather large; the cortex was wasted. The femoral veins were obstructed by old fibrinous clots.

The diagnosis of this case was obscure. The history was that of inflammatory disease in the neighbourhood of the ascending colon, but the emaciated and cachectic appearance and the presence of a hard nodule in the liver favoured the idea of malignant disease; the enlargement of the legs evidently arose from venous obstruction. When the patient was brought to the hospital it was believed that he could not survive many hours, and he was too ill to be raised from a recumbent position for the chest to be examined posteriorly. He was, however, free from cough or symptoms of thoracic disease.

The post-mortem examination fully explained the nature of

the case. Tubercular ulceration of the small intestine and of the cæcum had been followed by perforation of the latter; a post-peritoneal abscess was formed, which extended to the under surface of the liver; the distension of this abscess with pus and fæces led to the swelling below the liver, and the discharge of pus from the bowel appeared to confirm the supposition of abscess in the liver. Local peritonitis and adhesion had taken place, fixing the colon to the liver, and preventing the extension of the disease. The exhaustion consequent on this fæcal abscess was the cause of death. Tubercles were present in the lungs, and small vomicæ were found filled with pus; but the latter would not have afforded any physical sign whilst filled with fluid secretion. The enlargement of the mesenteric glands was tubercular. The malady was one of phthisical disease, affecting especially the intestine, leading to disastrous perforation, and causing death before the pulmonary disease had made extensive progress. The hydatid cysts were very old, and the calcareous envelope prevented fluctuation being detected. They were mere coincidental conditions, but tended to render the diagnosis obscure.

CASE 3. Inflammation of the colon from plumstones; ulceration, perforation, peritoneal abscess, thickening and contraction of the bowel (reported by Mr. F. C. Coley).—Charles G—, æt. 49, was a married man, who had resided at Kennington, of temperate habits and healthy, with the exception of attacks of indigestion. Some years ago he had resided in the country, and had much anxiety in his business; he then came to London (four years ago) and became a warehouseman. From the long hours of work he suffered from exhaustion; he lost his appetite, was unable to digest his food, and occasionally suffered from rigors at night. Two years previously his work was lessened by removal into the counting-house, and his symptoms were relieved. About three weeks before admission into Guy's Hospital, on September 23rd, 1874, the indigestion increased, and the patient suffered from pain in the right lumbar and inguinal regions. He was a well-built man, rather thin and sallow, with a care-worn expression of countenance. He complained of pain in the

right side of the abdomen below the liver, and a lobulated swelling could be detected at this part, which was with difficulty separated from the liver; it extended partly into the loin, and was moderately tender on palpation; the dulness in the swelling was not complete. The lungs and heart were normal. The tongue was white, and marked with the teeth. Urine healthy. He was ordered the bismuth mixture, and allowed fish and four ounces of wine. The bowels acted by medicine, the motions were fluid, pale, and free from blood. It was found after admission that taking food increased the pain in the right side. The mucous membrane of the lower lip was raised on its inner side by extravasated blood, but there was no breach of surface; the swelling gave pain during mastication.

On the 29th the motion was olive-green in colour, and free from blood; the pain in the abdomen was less. The temperature was taken many times, and varied from 98° to 99.4° . The bowels became constipated, and a small quantity of blood was passed. Full injections of water, two to four pints, brought away hardened fæces. They were repeated on successive days, and carbonate of ammonia mixture was given instead of the bismuth.

On October 22nd the swelling was smaller, but still tender and painful; it could be separated from the liver, and appeared to be adherent to the abdominal walls. The castor oil mixture was given, and acted gently but freely on the bowels; iodine was applied externally. The swelling remained tender, but the patient gained strength, and wished to return home, which he did on November 30th.

On December 28th I saw him at his own home in consultation with Dr. Cortis. The patient appeared thin and emaciated, he had lost strength, and the bowels acted sluggishly. The hardness on the right side was as distinct as when he left the hospital. The pulse was very compressible, and the appetite poor. He sank more quickly than we expected, and died on January 3rd, 1875. Dr. Cortis made a post-mortem examination, and was kind enough to send me the following report:—"On opening the abdomen a large portion of the liver was found very firmly adherent to the walls. Between the two at one part was found a circum-

scribed cavity containing four plumstones and the kernel of a fifth. This cavity communicated by a small opening with the colon, which beyond the cavity was very much thickened and contracted, forming a stricture through which an ordinary holder of a steel pen could just pass. The stones had evidently years ago lodged in the colon, produced inflammation and perforation (after adhesion), and afterward kept up the irritation and consequently the inflammation around the gut, producing the deposit and causing the stricture. The cæcum was firmly adherent at the under surface of the liver, and the perforation was at the anterior and external portion."

In this case the diagnosis was obscure. There was evidently disease of the ascending colon and cæcum, but the hardness at first was with difficulty separated from the liver; this separation could, however, afterwards be well made out when the bowel was emptied by injection, &c. It was more difficult to diagnose the nature of the malady than to recognise its position; there was hindrance to the free action of the bowel, and blood with mucus was passed; these signs indicated some ulceration, with narrowing of the bowel. The onset of pain about four hours after food also indicated disease of the larger bowel. The mischief had come on gradually and without any history of febrile disturbance such as we generally find in acute disease of the cæcum; the swelling was irregular and nodular in character, hard and tender, resembling in these respects malignant disease. We certainly did not suspect that there was such a source of irritation as a peritoneal abscess containing plumstones. It would seem that inflammation of the mucous membrane had been followed by ulceration and perforation; peritoneal adhesion had localised the effusion; the presence of the foreign bodies in the peritoneum led to gradual thickening of the coats of the bowel and to obstruction. The obstruction increased; the diminution of strength went on with the narrowing of the bowel, and the patient sank from exhaustion rather than from intestinal obstruction. The perforation in the first case was in the posterior part of the cæcum, and the abscess burrowed upward behind the intestine; in this it was at the anterior part of the ascending colon, not far from the angle of the transverse colon, and near to the liver.

As to the treatment of this form of disease I may again repeat that in simple accumulation in the cæcum gentle laxatives are of value; but that where inflammatory congestion of the mucous membrane has supervened, as in cæcitis and so-called typhlitis, then purgatives are injurious; the inflamed bowel has lost contractile power, the fæcal matter will not pass, and purgatives *increase* the inflammation. They often induce vomiting, and if an action follow it is merely loose discharge passing around the hardened fæces which remain behind; there is also the further danger if ulceration exist of leading to perforation of the appendix or of extravasation into the general cavity of the peritoneum. If, however, the inflammation has subsided, and there be persistent fulness as from extra-intestinal effusion, then gentle action affords relief. In the last case the action of the bowels relieved pain and distress; the castor oil mixture of Guy's, warm enemata, &c., were used, the patient for a time gained strength, and when he left the hospital appeared decidedly improved. The confined condition of the bowels prevented discharge from the abscess. In the first case the time for treatment was passed, and the patient was almost in a dying state when admitted.

IV. The disease in the ileum occurring during enteric fever is sometimes followed by disease in the cæcum or in the appendix of a tubercular character, and in some instances the enteric affection itself may lead to perforation and local peritonitis resembling true cæcal mischief. The following was an instance of the last kind, and many others might be adduced of disease occurring during phthisis and as a result of strumous disease.

CASE 4. *Peritonitis; perforation of intestine from enteric fever, simulating cæcal disease* (reported by Mr. C. F. Pickering).—Frederick N—, æt. 21, was admitted into Guy's in a dying condition, November 1st, 1876. His occupation was that of a cabinet-maker, and he had resided at Norman Road, Old Ford. His family history was good. Twelve years ago he had jaundice, and was ill for about a year. Four weeks before admission he was compelled to give up work on account of a sensation of great languor, with cough,

loss of appetite, weakness, and night perspiration; for three weeks previously he had felt poorly, but he continued at work till he "at last broke down." Three weeks before admission he became very ill, with weakness, perspiration, and general malaise; diarrhœa then came on, but in a few days was replaced by vomiting; the vomiting and diarrhœa alternated for some days, then severe pain in the abdomen at the umbilicus and in the hypogastric region supervened; the pain became so severe that a doctor was called in, and opium was given with the effect of relieving the suffering. No mention was made of spots on the abdomen. The pain in the abdomen generally lasted two or three hours, but sometimes it continued during the day. The stools were loose, and brown in colour. The patient had had no sleep for several nights. He attributed the illness to working late at night.

On admission he was very ill, the face thin and haggard, the body wasted; he was lying in bed helpless, inclining towards the right side; the feet cold, the breath offensive, the eyes glassy. The bowels had been confined since three days ago, vomiting of a greenish fluid then came on, and continued till admission; the tongue was red at the edges. The abdomen was tympanitic, but the pain had ceased; the right side was more swollen than the left, especially in the iliac region, where there was dulness on percussion; the veins on the right side of the abdomen were more distended than on the left. A week previously a small quantity of blood had been vomited. The skin over the abdomen was desquamating from the liniments that had been applied. Pressure in the right iliac fossa produced a sense of nausea, and gurgling could be felt in both iliac regions. The intestines were distended, especially at the upper part. No blood had been passed by the rectum. The liver and the spleen were normal. The thoracic viscera were healthy. There was some difficulty in passing urine; it was abundant, of sp. gr. 1028, pale, clear, and contained a slight deposit of mucus and urates; it was free from sugar and albumen. Temperature 101°; evening temperature 99°.

On the 2nd the vomiting continued, the pulse very feeble, the abdomen was unchanged. Temperature, morning 99°; evening 98.6°; pulse 128.

On the 3rd the exhaustion and restlessness increased;

the extremities were cold ; temperature 103° . He sank about 5 o'clock p.m.

Inspection was made on the following day. On opening the abdomen coils of distended small intestine could be seen ; in the right iliac region the coils were matted together, and plastic adhesions and pus were collected there. There was also some coagulum of blood, and a considerable quantity of blood had also passed into the pelvis. The cæcum was pushed upward quite away from its normal position. In the small intestine, about two feet from the cæcum, were three ulcers. The first was about an inch from the ileo-cæcal valve ; it was round, and about the size of a sixpenny-piece : the second was a few inches higher up the bowel ; and the third was oval, transverse, and presented in the centre a perforation about the size of a pin's head. The ulcers were situated in Peyer's patches, but there was no enlargement of these glands. There was no tubercular deposit in the mucous membrane, but there was congestion of the whole of the mucous membrane of the small intestine. The mesenteric glands were enlarged. The kidneys were healthy, but rather pale. The thoracic viscera and the larynx were healthy.

This patient was dying from peritonitis when brought to the hospital, and it is probable that the shaking of the cab during his conveyance from home greatly aggravated the symptoms. The disease was situated in the region of the cæcum, and at first it was believed that perityphlitis or perforation of the appendix had set up the peritonitis. There was no evidence of phthisis, but the patient was too ill to be examined thoroughly.

The post-mortem examination, however, showed that there was neither tubercular nor strumous disease. The examination also showed that the small intestine was the seat of the disease, and the cæcum was pushed aside from its normal position. Perforation had taken place, and peritonitis, at first local, then general, was produced. The adhesions of the intestine in the iliac fossa localised the effusion of pus ; some pus, however, with blood probably from the ulcerated vessels at the seat of perforation were found both at this part and in the pelvis. The question arose as to the cause of the ulceration ; was it from simple enteritis ? for the whole of the mucous

membrane of the intestine was congested ; or was it the result of enteric fever ? Probably the latter, for there was enlargement of the mesenteric glands ; the ulceration was at Peyer's patches, and the duration of the disease, the weakness, the diarrhoea and other symptoms were quite consistent with enteric fever. It is well known that in some cases of this complaint the earlier symptoms may be very mild, and during the third or fourth week perforation may suddenly take place. Some years ago a patient applied for admission ; he had been ailing for three weeks, but had not kept his bed ; he walked to the hospital, and on the day of his admission he sat up at tea with the other patients. The same night sudden perforation took place, fatal peritonitis was produced, and on examination it was found to have been caused by an attack of enteric fever. Several cases of a similar kind have come under my own observation.

V. Some diseases of the appendix cæci are most obscure, for scarcely any symptom may indicate the gradual ulceration of the mucous membrane till perforation takes place, and leads to acute perityphlitis or false peritonitis. The appendix varies greatly in its position and in its length. In an instance that I saw some years ago in consultation, a young woman was affected with all the symptoms of acute inflammation of the cæcum itself, there was obstruction, and severe pain in the iliac fossa, followed by peritonitis. The post-mortem examination showed that a long appendix had turned over the end of the ileum, it had become adherent, and had led to obstruction of the bowel ; acute peritonitis preceded the fatal issue. Foreign bodies are sometimes found in the appendix, as shot, cherrystones &c., but more frequently the gradual conversion of faecal matter mixed with phosphates produces an exact imitation in size and appearance of true cherry or date stones ; these foreign bodies may cause slow ulceration, and lead to perforation ; in other instances, the intestinal opening of the appendix becomes occluded, secretion goes on and a distended pouch is produced ; or, again, a strumous mass is found to block up the extremity, and as it softens down gives the appearance of an abscess. We will not enter into details of cases of this kind that have come under our notice, further

than to remark that they are more frequent in young persons affected with tubercular disease, and that in chronic phthisis, when the ileum is ulcerated, it is comparatively rare to find the appendix free from some morbid change.

VI. In *cancerous* disease of the cæcum the symptoms are more gradual, there is less pain, and an absence of febrile symptoms; again, the obstruction is less severe; these cases may extend over several months, and are not likely to be confounded with acute disease of the intestine. The dulness is well defined, the hardness is nodular, there is cancerous cachexia, and if ulceration take place there is irregular action of the bowels and discharge of blood and mucus. The onset of this form of disease is sometimes insidious, and may be mistaken for simple obstruction; or again the rigidity of the superficial muscles from sympathy with the disease beneath has sometimes led to the supposition that the hardness was merely muscular or phantom tumour. In an instance of this kind admitted into Guy's Hospital many years ago, in a young woman, the rigidity led to the diagnosis of muscular tumour; the symptoms were relieved by aloes with steel, but in a few months she came back to the hospital, and died from malignant disease of the cæcum.

VII. It is well known that a common position for *intussusception* of the bowel is the union of the ileum with the cæcum, the small intestine being intruded within the cæcum. In a case of this kind which came under my own notice the symptoms closely resembled cæcal inflammation. There was severe pain in the region of the cæcum, constipation of the bowels, general distress; dulness at the affected part; but when closely watched the clinical condition was not that of ordinary typhlitis; the pain was paroxysmal, it was of the character of colic; it was severe but not persistent; when it came on rigidity of the part at once ensued, and strong contractile movements were observed, but as the pain passed off the rigidity relaxed; there was no tenderness. The bowels were obstinately confined, the local inflammatory disease increased, and the patient sank; unfortunately there was no post-mortem examination. There was no discharge of blood from the bowel.

The disease of parts immediately in contact with the cæcum often leads to symptoms resembling mischief in the bowel itself. The bowel closely sympathises with diseased action going on in the neighbourhood. The first condition of this kind that I would notice is disease in the iliac fossa connected with the sacro-iliac synchondrosis; the inflammatory mischief behind the bowel leads to constipation, the cæcum becomes distended, there is dulness on percussion, local tenderness, febrile excitement, and many of the symptoms of cæcal mischief. The pain, however, is found to extend towards the median line, and it reaches more upon the thigh and to the dorsum of the ilium, and the external cutaneous nerve is often affected. If the disease be connected with the spine and there be suppuration in the course of the psoas and iliacus muscles, there is generally some indication of disease in the spine itself.

The following case was one of great interest, and for a time of obscurity.

CASE 5. *Inflammation in the loins and in the iliac fossa; abscess.*—A gentleman, æt. 55, for two weeks had had constant pain in the loins; after exposure to cold he had rigor and febrile symptoms and became very prostrate. The bowels were confined, and there had been fulness in the region of the cæcum; the malady had been regarded at first as rheumatism, and afterwards as disease of the cæcum. I saw him in consultation on December 1st, and at that time the fulness in the region of the cæcum and ascending colon had disappeared, nor was there any pain in the testicle; there was no irritability of the bladder, and the urine was free from blood and albumen. Deep pressure in the iliac region produced pain. The principal pain was, however, in the right loin, which was found on careful examination to be swollen and tender; the pain extended to the crest of the ilium and down the outer part of the thigh. The abdomen was supple, the bowels were free, there was no enlargement of the liver, the tongue was slightly furred, pulse irritable, 112, temperature 100°, the skin slightly perspiring; the thoracic viscera were normal.

On the 4th the patient seemed better, more easy, temperature 99°; he improved for several days and was able to get on the sofa.

On December 18th he appeared distressed, felt weak, and there was profuse perspiration. The pain in the loins and at the crest of the ilium remained and extended to the external abdominal ring, but there was no pain in the testicle; the pulse was irritable, 104, temperature 101.6° , the skin hot, sleep disturbed.

On the 23rd the pain was gone, but there was great prostration of strength.

On the 29th there was severe pain at the sacro-iliac synchondrosis, and some fulness could be felt above Poupart's ligament, where there was dulness on percussion, and the temperature had risen to 102.6° . An eminent surgeon confirmed the opinion that there was abscess.

On January 15th the pain was severe especially on movement; the legs were flexed, there was more bulging above Poupart's ligament and fluctuation could be felt; there was œdema of the right loin, and great constitutional disturbance. From the great unwillingness to have any operative relief the opening was postponed till January 28th. The part above Poupart's ligament previously dull had then become resonant; a small exploring trocar was introduced at the part, and gas with a few drops of pus exuded. A fuller opening was then made above Poupart's ligament, and most offensive pus exuded, but no fæces.

On February 1st there was abundant discharge of healthy pus, and relief to the constitutional symptoms. The health slowly improved and strength was regained, but the sinus did not completely close for six months.

The diagnosis in this case was at first very difficult. The pain in the loins suggested rheumatism and disease of the kidney; then the fulness of the cæcum, from sympathy with the affected part, led to the idea of disease of the colon; but the bulging in the loin, the pain on the outer part of the thigh, and after a few weeks the bulging above Poupart's ligament, shewed the character of the complaint. It was feared that the bowel communicated with the abscess from the fæcal odour of the pus; this was soon found not to be the case, and there was no proof of any disease of the bone producing the abscess; it appeared to be in the cellular tissue connected with the quadratus lumborum muscle, and to have passed downwards into the iliac fossa. The patient would have been less

prostrate if he had consented to have the abscess opened at an earlier period.

In another case of this kind that I saw in a young man several years ago abscesses were opened at the anterior part and afterwards in the lumbar region ; extreme prostration followed, and it was shown that there had been communication with the bowel, for an apple pip passed from the abscess in the loin ; here it would seem that perityphlitis had been set up, and an ulcerative communication formed with the bowel. In the former the mischief was confined to the tissues external to the bowel.

In a third class of cases we find that an external abscess may open secondarily into the intestine.

In *renal calculus*, when there is severe pain from spasmodic contraction, the bowel sympathises with the morbid action, and constipation and distension of the intestine are produced. Hence, it is often supposed to be primarily affected, and this idea is confirmed in the mind of the patient by the relief afforded when the bowels are moved. A lady came to me some years ago who was supposed to have disease of the liver, then of the stomach, and lastly of the intestine ; but on careful examination it was found that the disease was renal calculus ; a small quantity of blood was found in the urine by microscopical examination, and when the patient was kept at rest all the symptoms subsided, and her health was restored. A man, aged 64, was under my care in Guy's Hospital with a large swelling extending into the right iliac fossa ; it reached the liver, and was relieved occasionally by the discharge of a large quantity of pus with the urine ; the pain then subsided, the swelling disappeared, and the symptoms were relieved. This discharge was repeated, and it was found that from sixteen years of age he had suffered, but that for many years the symptoms of renal irritation had been in abeyance ; he was a shoemaker by trade, and had been able to follow his occupation till within a few months of his death. Then persistent pain in the right side came on, and gradual exhaustion preceded death. It was found on examination that a calculus had destroyed the right kidney ; it had blocked

up the ureter, the pelvis of the kidney became distended with pus and the secreting tissue had become absorbed; this distension attained to an enormous size, so that the large tumour before mentioned was formed; when, however, the ureter became dilated to a larger size than the calculus, the free discharge of pus relieved the distension of the pelvis, and the symptoms were at once mitigated. At the upper part of the kidney a large medullary growth formed; it became adherent to the diaphragm behind the liver, and led to the fatal termination. The tumour when seen fully distended might have been mistaken for a cæcal mass, so low on the iliac fossa did it extend downwards.

When, however, there is mischief in the pelvis and inflammatory disease passes upwards, symptoms are produced which closely resemble disease of the cæcum. Congestion and inflammation of the right ovary are often mistaken for disease of the cæcum and of the intestine. These cases sometimes come on after exposure to cold, during the period of menstruation; the flux ceases, severe pain, febrile symptoms, constipation, &c., are produced, and the whole of the cæcal region is tender on percussion. The treatment best calculated to afford relief is that which we have recommended in acute disease of the cæcum.

CASE 6. *Suppuration of the ovary; pelvic cellulitis simulating cæcal disease; peritonitis* (reported by Mr. W. Ernest Dring).—Elizabeth G—, æt. 31, was admitted into Guy's Hospital on December 18th, 1873, under my care. About six weeks previously she had pain in the right side, which was called rheumatism; but two weeks before admission she had pain and tenderness in the right iliac fossa; these symptoms increased in severity, the bowels were confined, the appetite lost, but she had no sickness; the severity of the symptoms was lessening when she was admitted. She was a single woman, who had been living as cook in a gentleman's family, and she was fairly nourished; she rested in bed on her back, with the legs drawn up; the skin was moist, tongue red in the centre, appetite had returned, and the bowels were open; there was pain produced by percussion over the liver, and the abdomen was moderately distended. She complained of shooting pain

below the umbilicus towards the median line downwards to the pubes; this part towards the right side in the iliac region was tender and painful on pressure; the pain was not constant; leeches and a blister had been applied. The pulse was small, but regular; temperature 100.2° ; the urine was scanty and the passage of it produced pain; there was a considerable whitish deposit of phosphates and urates; sp. gr. 1030, free from albumen and sugar; menstruation was regular. It was at first supposed that this poor woman was recovering from an attack of cæcitis, and she was kept very quiet in bed; spirits of chloroform with solution of morphia and infusion of calumba were given three times a day. After watching her for some days it was found that the pain did not subside, and that the symptoms differed from those of cæcal disease; the fulness was nearer to the brim of the pelvis and less over the iliac region. It was believed that there was disease about the right ovary, and this opinion was confirmed by my late colleague Dr. Phillips, who was requested to make a vaginal examination. His report was as follows:—"The posterior part and right side of the pelvis is occupied by a firm and fixed swelling, the upper margin of which is to be felt at the pelvic brim on the right side. The cervix uteri is pushed considerably to the left. The probability is in favour of some (probably old) mischief in the broad ligament, perhaps ovarian, with recent and extensive periovaritis." A few days later (January 19th) the pain increased in the region of the cæcum, the bowels were opened, but there was loss of appetite, and the temperature rose to 101.9° . On the 22nd there was intense pain in the abdomen at the right iliac and hypogastric regions, and it was evident that she was suffering from acute peritonitis. Temperature 104.4° . She sank on the following day. Post-mortem examination was made about ten hours after death. There was slight recent pleurisy at the base of the left lung, but the lungs were quite healthy. When the abdominal cavity was opened the peritoneum was found to be thickly covered over with healthy looking pus. The coils of intestine were all matted together by lymph, and whenever the adhesions were disturbed, large quantities of thick yellowish-green pus welled up, so that the serous cavity contained twenty ounces or more. All the pelvic organs were united together and coils of

intestine were attached to them. On dissecting them out, the right ovary was found to be about two inches in diameter; it contained several deposits of creamy pus, and opened into an irregular abscess situated behind it. The abscess burrowed downwards in the pelvic cellular tissue behind the uterus, and between it and the rectum; it extended upwards along the rectum and, near the sigmoid flexure, opened into the peritoneal cavity; below it communicated with the rectum by an irregular opening about the size of a sixpence, three inches above the anus. The other ovary was embedded in dense tissue, and could with difficulty be dissected out; it was large, rather mottled, and on section was studded throughout with yellow pus-like spots; they were not encapsuled, but had an irregular margin; some of them were softening in the centre, and were regarded as caseous tubercular patches. The small and large intestines were healthy; the liver was fatty, and its capsule adherent to the diaphragm. The lumbar glands were enlarged on the left side; the spleen, kidneys, and bladder, &c., were healthy. Some years ago I witnessed a case in which the ovary had become adherent to the colon, and an ovarian cyst capable of holding half a pint of fluid had opened through the bowel: the patient died from some other disease; the cyst was filled with gas and fluid.

The interest of these individual cases, and the illustration they afford of some of the difficulties of the diagnosis of cæcal disease, must serve as an apology for introducing them into our Reports.

TWO CASES
OF
PUNCTURED FRACTURE OF THE SKULL
SUCCESSFULLY TREATED BY TREPHINING.

BY N. DAVIES-COLLEY, M.C.

CASES of punctured fracture of the skull are so rare that the two following examples of the injury and its successful treatment may be thought deserving of record. I am indebted to Mr. T. C. Barlow and Mr. L. W. Reynolds for part of these reports.

CASE 1.—Samuel C—, æt. 5, on September 2nd, 1872, was playing in a stranded barge, when he fell from its side inwards, about five feet down, and struck his head against a nail which projected from the bottom of the barge. He was at once brought to the hospital and admitted into Dorcas Ward. There were some symptoms of concussion. He had vomited soon after the accident. He was sleepy, but could be roused, and he was sensitive to pain. There was no paralysis. The pupils were equal and contracted normally. About two and a half inches above the left eyebrow, and one inch from the median line, there was a small circular opening, around the edges of which was blood mixed with something which looked like brain substance,

Some chloroform was at once administered, and a crucial incision made with its centre over the puncture. I then removed with a trephine about three-eighths of an inch in diameter the bone immediately surrounding the wound. A portion of the inner table was deficient in the circle removed, and at the side of the opening made by the trephine I found that some bone projected vertically inwards towards the brain. By means of a forceps this was laid hold of and extracted, and it was found to consist of a thin plate of the inner table, measuring one half by three eighths of an inch. The dura mater was torn and this plate must have been embedded in the brain substance.

The wound was then sewn up and carbolic gauze applied. The operation had been performed under the spray. Ice was applied to the head, and he was allowed no food but milk. For the first three or four days he occasionally vomited, and he was rather drowsy by day and restless at night. Once he was said to have been delirious and to have tried to get out of bed. There was, however, no rise in temperature, and the pulse varied between 60 and 90 beats the minute. The wound was dressed every other day. On the second occasion it was found that no union of the flaps had taken place, and there was a mixture of pus and brain matter on the surface of the wound. (Under the microscope this substance was found to contain pus-corpuscles and nerve-tubes.) Nine days after he came in, a swelling covered by granulations had formed in the centre of the wound about the size of a large pea. His temperature was observed every day, and never exceeded $100\cdot4^{\circ}$.

On September 23rd the ice was left off. He still had a small hernia in the wound, but it was never seen to pulsate.

Oct. 3rd.—Interval between the dressings increased to three days. The hernia is assuming a fibrous shreddy appearance.

15th.—Spray left off. Wound was dressed with lint soaked in one part of carbolic acid to forty of olive oil.

25th.—The hernia has come away and left a healthy ulcer about one inch in diameter, with a small central projection.

30th.—Allowed to get up.

Jan. 15th.—Ulcer well. Patient went out. For the last two months he was only kept in on account of the wound. Other-

wise he was in perfect health, playing and running about the ward all day.

CASE 2.—Arthur C. B—, æt. 2, about an hour before admission had fallen from a chair on the fender, a projecting piece of which stuck in his head and broke off. But little bleeding followed. The child was observed to be sleepy.

He was brought to the hospital and admitted into Charity Ward. A flat piece of iron was firmly fixed in the skull, about an inch behind, and half an inch above the left mastoid process. It was directed obliquely downwards and forwards. There were no signs of compression. I found the child sitting up in bed, comfortably eating a biscuit.

At 2.45 p.m. chloroform was administered, and the injured bone was laid bare by free incisions. I then drew out the piece of iron, and was obliged to use considerable force for that purpose. It was found to be an inch and a quarter long by half an inch in breadth, and as more than half an inch had penetrated the skull, there could be hardly any doubt that the brain had been wounded. A small-sized trephine was then used and a circle of bone about the size of a fourpennypiece removed. It came away in two halves, as the aperture made by the piece of iron was about as broad as the diameter of the trephine. I noticed that one half consisted only of the external plate of the calvarium. The portion of the internal plate corresponding to this, and rather larger than it, was found pressing upon the dura mater, and readily removed. There was an opening in the dura mater, from which a small quantity of brain matter had oozed.

The operation was performed under the carbolic-acid spray, and the usual dressing of gauze was then applied.

In the evening some convulsive movements of the right arm and leg were observed.

May 22nd.—Child has had a tolerably quiet night. Pulse 140; temp. 98.4°.

26th.—Wound nearly healed.

June 10th.—A small space is healing by granulations, which are rather prominent at one point. The greater part of the wound has healed by primary union.

21st.—Allowed to get up.

July 2nd.—Went out with the wound healed. No inflammatory symptoms followed the operation, and there was no indication of cerebral disturbance at any time subsequent to the evening of the injury.

These two cases support the rule, which most of our text-books either omit or fail to impress, that in punctured fractures of the skull it is the surgeon's duty to trephine at once, without waiting for symptoms of compression or irritation. In both these children the external opening in the bone was small, while internally a sharp, thin plate of the inner table was detached and pressing upon the torn dura mater and upon the surface of the brain.

If the operation had not been performed it is probable that the loose pieces of bone would have set up suppuration, and as the channel for the discharge of the inflammatory products would have been so confined, it is not unlikely that this suppuration would have been followed by general arachnitis and death.

REPORT ON OPERATIVE SURGERY.

(WITH ILLUSTRATIONS.)

By THOMAS BRYANT.

PART III.

ON TUMOURS OF BONE.

IN the *first* part of this series of papers on operative surgery, published in 1874, I recorded some cases of tumours involving the bones of the face and jaws; in the *second* part, published in 1875, some very interesting examples of cancer of bone, including cases of congenital and of infantile cancer, all of which happened to be in male children; of cancer invading bone from without, involving it as a secondary deposit and as a primary disease; and in the present, or *third* part, I propose to continue the same subject, quoting examples of simple tumours of bone as well as of cancer; the whole series taken together forming I believe a good exposition of the clinical phenomena generally met with in tumours of bone, with their treatment and pathology.

CASE 1.—Myeloid tumour of the head of the tibia; amputation at the thigh; recovery; no return fifteen years subsequently.

CASE 2.—Periosteal sarcoma growing from the inner condyle of the femur; amputation at the thigh; recovery; no return three years subsequently. (Plates I and II.)

CASE 3.—Osteo-chondroma of femur; amputation at thigh; scarlatinoid rash; melanuria; death from pyæmia; endocarditis and suppuration of joints. (Plate III and Woodcut.)

CASE 4.—Fibrous carcinomatous tumour developed in shaft of tibia; fracture of bone at seat of disease; repair of fracture; rapid growth of tumour; amputation; recovery. (Plate IV and Woodcut.)

CASE 5.—Cyst in shaft of tibia of nine years' duration; trephining bone; cure.

CASE 6.—Osteitis deformans of Paget. (Woodcuts.)

CASE 1.—*Myeloid Tumour of the Head of the Tibia; amputation at the thigh; cure; no return fifteen years subsequently.*

(Reported by Mr. LIONEL BOOTH.)

Louisa B—, æt. 24, a married woman, residing in Essex, was admitted into Guy's Hospital on April 11th, 1861, under Mr. Bryant, with some affection of the knee.

She is a pale anæmic woman, but states that her general health has been pretty good.

She has had one child born alive and seven miscarriages, these having taken place about the third month. Menstruation regular.

She first noticed something wrong with her leg nine months ago, by feeling, in the lower part of her knee, a dull aching pain, which she supposed was rheumatism; the knee at this time was somewhat swollen.

For six months this pain and swelling continued, when she fell over a hassock and felt something snap at the inner side of the lower part of the popliteal space. At this time she was under treatment and had blisters, strapping and bandages applied, but without benefit.

Two months ago the swelling was punctured, but blood only escaped, and the swelling was not lessened. At this time there was pain not only in the knee but in the leg and foot.

On admission there was a large swelling in the region of the head of the tibia which it apparently involved; it had a smooth outline, with hard and soft points on its surface, being more or

less elastic. The veins about the knee were very full of blood. The joint moved smoothly although to a limited degree.

There was no enlargement of the inguinal glands. The woman complained of pain in the foot and leg of the affected side and also in the tumour, but it was not severe. Her general condition was good. Tongue clean, bowels regular.

The disease was clearly situated in the head of the tibia, and was supposed to be a new growth expanding the bone. It was thought to be myeloid. Amputation was proposed, no other treatment being admissible upon the diagnosis. The patient not at once falling in with this view left the hospital, but returned in June with the tumour larger and more painful, and on June 10th, 1861, Mr. Bryant amputated the leg, taking it off at the lower third of the thigh and a rapid recovery ensued. The tumour turned out to be a splendid specimen of myeloid growth which had originated in the head of the tibia. The cartilage covering the growth on the joint surface was intact; indeed, the tumour and joint were separated by this tissue alone. The other bones were sound.

This patient went on well after the operation, and in 1876, fifteen years after she had been under Mr. Bryant's care, came to Guy's with her son to report progress. She was in excellent health in all ways and had a capital stump, no signs of any return of the disease having shown themselves:

She had had three children since the operation, and all were healthy.

Remarks.—The case just recorded may be regarded as a typical example of myeloid tumour situated in the head of a bone, containing as it does, both in its clinical and pathological features, an epitome of what is usually met with in that disease.

It was found in a young and otherwise healthy subject; it began without any definite cause; it commenced as a painless expansion of the epiphysial extremity of a bone; it remained unrecognised until it had acquired a certain size; having attained a certain size it gave rise to a dull aching pain, which was regarded, as all such pains are apt to be, as rheumatic; it did not interfere with the movements of the joint; it was unattended by any enlargement of the lymphatic glands, and in no ways affected the general condition of the patient.

As the tumour grew, however, fresh symptoms appeared ; by the expansion of the bone the nerve trunks became involved, and pain in the course of their distribution was complained of ; as the bone became more expanded its capsule yielded and the growth of the tumour was more rapid—the repressing influence of pressure having been lost ; the surface of the tumour also became altered ; the globular outline and smooth osseous surface which characterised its early stage were exchanged for a surface presenting a more irregular shape, and upon which hard and soft points were to be felt, the hard points representing the bony capsule, and the soft the growth bulging out between the fissures in the over-expanded and absorbed bone.

Symptoms of venous turgescence, moreover, showed themselves, the enlarged blue veins meandering over the tumour as much denoting the vascularity of the growth as it did the interference with the venous circulation of the involved limb. The movements of the joint became also more limited—not, however, from any joint disease or loss of cartilage, but purely from mechanical causes—causes due to the expansion of the diseased bone.

The general health of the patient was good, and there was no enlargement of the lymphatic glands ; in fact, the only symptoms that denoted the presence of the growth were local, and due to mechanical causes—namely, the chronic expansion of the upper articular end of the tibia.

The treatment adopted in this case in its principle was doubtless correct, viz. the free removal of the disease, for nothing less than this could be undertaken, although with my more recent experience I should probably have amputated the leg at the knee-joint rather than at the thigh ; for by such an operation I should have taken away what required removal by the simplest means with the minimum loss of tissue, and by an operation which is doubtless far less fatal than amputation at the thigh or leg ; by an operation also that provides an excellent stump for subsequent progression. The success of the case was, however, very satisfactory.

It is to be noted also as a point of extreme interest that this patient was well fifteen years after the operation, with an excellent stump and without the slightest evidence of the existence of any return or secondary growth ; for it is to be

confessed that the pathology of these myeloid or giant-cell sarcomatous tumours is not yet quite clear—that these growths can neither be said to be always of an innocent nature, nor free from the possibility of a return either on the spot or in some more remote region; in fact, it is not certain whether these growths should be placed amongst the innocent or malignant class.

This case, so far as it goes, and it has been carefully observed from the first, tends much to show that the disease is of a local kind.

In support of this view I must also refer to a case, which I published in the first part of these series of "Reports on Operative Surgery" in 1874, vol. xix, p. 113, Case 5, one of myeloid tumour of the right upper jaw upon which I performed three operations; it was in a girl, aged 8. The first operation was performed January 10th, 1871, and the third operation on November 18th, 1872, a return of the disease having been the cause of the last. In that operation I took away a large mass of disease which occupied the position of the right upper jaw, and in doing so made a clean section of the bone in the median line of the face; this section was thick and soft, and on subsequent examination was found to be infiltrated with dark red myeloid substance similar to that found in the soft parts of the growth. Indeed, Dr. Goodhart reported "that it must be taken as proved that part of the growth extended across the median line and had been left behind."

I have, therefore, watched the progress of this case with interest and anxiety, and am pleased to have to report that in November, 1876, that is, four years after the last operation, the child is well. There has been, and is no evidence of any fresh growth. The thickening that existed in the upper jaw after the last operation in 1872 has disappeared, and if (and it cannot be doubted after Dr. Goodhart's statement) myeloid elements infiltrated the line of bone section and consequently the left upper jaw they have either broken up, been absorbed, or developed into normal bone tissue. At any rate the child is well, and the fears that naturally existed respecting a return of the disease, or rather a continued growth of what was there, have been clearly proved to be groundless.

In a clinical point of view this termination of the case is,

therefore, most instructive, for it teaches us that a bone may be much thickened and infiltrated with giant cells, and yet recover its healthy structure.

In a pathological point of view it is also no less interesting, although it is somewhat inexplicable, but it certainly raises the question as to the significance of the presence of these giant cells in the cancellated bone structure of the young; but this point I leave to the pathologists.

The two cases, however, taken together tend towards the support of the simple nature of myeloid growths, and as such are now recorded.

CASE 2. Periosteal Sarcoma growing from the Condyles of the Femur ; Amputation of Thigh ; Recovery ; no return three years subsequently.

(Reported by Mr. R. BEVAN.)

Thomas B—, æt. 29, was admitted into Job Ward on the 26th of May, 1873, under the care of Mr. Bryant. Seven or eight years before admission he sprained his right knee, and walked lame for about three or four weeks, but did not feel any effects from the accident afterwards. About two years ago he struck his right knee, when a slight swelling appeared on the inside, but this soon subsided and there was very little pain in it, so that he worked as usual; but about six months ago it gradually increased up to the time of his admission, causing considerable pain on manipulation and preventing his straightening his leg. He had also had an attack of erysipelas of the face and head a year before; it lasted three weeks and never returned.

When admitted there was a considerable swelling about the inner condyle of the right knee-joint, causing much pain on manipulation; he was able to flex his leg, but was unable to straighten it, so that in walking it gave the appearance of shortening. The limb was flexed with the foot everted, but the leg was not displaced backwards; the eversion became more marked subsequently. On looking at the limb the distortion of the joint is mainly apparent over the internal condyle. The skin over it is normal in appearance, but hotter than on the

left side. On manipulation the internal condyle is replaced by an irregularly nodulated hard swelling which extends around the inner side of the joint into the popliteal space (*vide* Plate I), and by its size obscures the junction of the femur with the tibia. It is slightly painful on pressure and not very elastic. There were no enlarged glands in the groin.

The patient left the hospital for domestic reasons on the 2nd June, but was readmitted on the 10th July on account of his knee getting worse; it was then found to measure $16\frac{7}{8}$ inches in circumference, and the sound one 14 inches; there was then slight enlargement of the glands below Poupart's ligament; his general health was good.

July 15th.—The limb was amputated through the middle of the thigh by the mixed method of amputation. The femoral artery was secured by torsion; the flaps were carefully adjusted; the stump was fixed upon a posterior splint and a drainage tube inserted.

On examining the growth after the operation it was found very near the skin over the inner condyle of the femur; it also infiltrated the soft parts on the side of the joint and had got to the ligaments, so that inside the joint the synovial membrane was vascular and thickened; about two or three ounces of bloody serum were in the cavity of the joint, and at the posterior part of the femur near the intercondyloid notch the growth had appeared bulging into the cavity.

A vertical section of the bones and tumours having been made (Plate II), it became clear that the disease originated beneath the periosteum and synovial capsule of the joint, in one part, indeed, projecting into the joint. It had a peculiar lobulated aspect and a firm consistence, and failed to yield much juice on scraping. It had evidently originated in the periosteum covering the posterior part of the inner condyle of the femur, and had increased in the direction of least resistance towards the popliteal space and joint (*vide* Plate II).

Dr. Goodhart's report on the tumour.—"Microscopical examination showed enormous numbers of free nuclei of oval and rounded form. Some rod-shaped nuclei and cells of spindle shape with one or two nuclei, and stellate cells were also seen. The tumour was not examined till after forty-eight hours had elapsed from amputation, and it had then become soft and

brain-like, so that it is possible the large number of nuclei then visible were really only free by reason of post-mortem solution of their cell-wall. It was certainly a much more resistant tumour immediately after the operation, and gave on scraping comparatively little juice. Subsequently there was plenty. This, however, is a point of only secondary importance, and has to do with the nomenclature of the growth, whether it should be called a medullary or spindle-cell sarcoma, rather than with its life-history. Clinically this is but of small importance, as there can be no doubt that it is a most malignant form of growth and certain to recur at some time or other. After hardening, the tumour presents no other appearance than the alveolated structure of a medullary sarcoma."

"With reference to its seat of origin I am disposed to consider it rather as growing from the connective-tissue or intermuscular septa than from the periosteum. The latter membrane appears to have only lately become implicated."

July 16th.—Wastwicesick after the operation; had a throbbing pain and slept lightly. Pulse 110; temp. 102°. The following night slept better. Everything went on well, and on the 21st the leg was dressed for the first time; there was slight discharge; the flaps had almost entirely united. The stump was dressed also the following day. The patient's progress was most favorable; he was getting about the ward on the 8th August, the wound being healed, and he left the hospital on the 16th, one month after the amputation. In November, 1876, the man was quite well.

Remarks.—There is nothing remarkable in the history of this case, although periosteal sarcoma in a general way more frequently attacks the shafts of bones than their epiphysial extremities. As usual it appeared in a young subject, commenced after some history of an injury, and grew insidiously. At first, when the presence of a new growth began to be indicated, we thought that it was situated in the inner condyle, although the peculiar rotation outwards of the leg with eversion of the foot was hardly explicable on such a supposition. Indeed, it was from this latter symptom that the periosteal nature of the growth suggested itself.

As time passed and the tumour increased in size, its periosteal features became more marked, for, as the report states, "the

condyle of the femur was replaced by an irregularly nodulated hard swelling which extended round the inner side of the joint into the popliteal space, and the line of junction of the femur with the tibia was lost. It was, moreover, painful on pressure and was not associated, as tumours of bone mostly are (*vide* Case 1), with a dull aching pain.

It was, however, impossible to diagnose the nature of the growth with respect to its malignancy or non-malignancy. In either case, however, the practice that we followed, amputation of the limb, was the right one, and the successful termination of the case justified the step. This was strengthened by the continued good health of the man three years later, although the report of Dr. Goodhart, looking at the case from a pathological point of view, is hardly of such a nature as would have allowed us to expect an immunity from the disease so long as I have recorded; for, as a rule, periosteal sarcomatous growths too commonly follow the line of cancerous diseases and return soon after removal.

A sad case of this kind is recorded in a former paper, p. 129, vol. xix, series iii.

CASE 3. *Osteo-chondroma of Femur; Amputation at Thigh; Scarlatinoid Rash; Melanuria; Death from Pyæmia; Endocarditis; Suppuration of Joints.*

Elizabeth M—, æt. 34, a married woman, mother of four children, was admitted into Guy's Hospital under Mr. Bryant's care on September 25th, 1867, with the following history. In the autumn of 1861 she fell and struck her right knee; the joint subsequently was swollen for a few days, and then all traces of injury passed away.

In February, 1864, she had pain at the same part and then noticed that there was a small hard immoveable lump, fixed at the lower end of the right femur just internal to the patella. A few days afterwards an attack of rheumatic fever commenced; most of the joints in her limbs were then swollen, and only after several weeks' illness did she recover. During this time the tumour was enlarging.

Early in 1865 she had a second attack of acute rheumatism, and was for many weeks in bed.

In May, 1867, for a third time, she had rheumatic fever, though slightly. With these exceptions her general health has been good.

Previous to the illness in May, 1867, the tumour in the thigh had increased slowly, but subsequently its growth became rapid. It did not prevent her from fulfilling her ordinary household duties, except that she could not kneel.

On admission.—She seemed then in good health, and the cardiac and pulmonary sounds were natural.

At the lower part of the right thigh was a hard, tense, inelastic swelling, apparently arising from enlargement of the condyles and lower part of the shaft of the femur, to a distance of nine inches from the lower articular surface of the bone. Measured transversely with callipers between the most prominent parts of the condyles, the diameter of the right thigh was found to be six inches, that of the left between corresponding points was three inches and a half. Antero-posteriorly the right limb measured six and a half, the left three and a half inches. The tumour at its upper part, that is, the middle of the thigh, had a diameter of five and a half inches, the left limb at the corresponding level measured four inches. The circumference of the tumour over the patella was twenty inches; of the left limb at the same level thirteen and a half inches. The enlargement extended around the whole circumference of the femur, and was somewhat lobulated on the surface. The patella, quite moveable, was pushed bodily outwards. As the patient lay in bed the leg was fully extended on the thigh, and she could flex it to an angle of 130° . The heels were exactly at the same level, the right limb being not in the least elongated. There was no effusion into the knee-joint. The arteries of the foot pulsated naturally, and she could walk without any pain. The tumour was not generally painful and tender, though occasionally there would be a dull aching sensation about it. The glands in the groin were not enlarged.

October 5th.—The thigh was amputated by Mr. Bryant at the junction of the upper and middle thirds. Carbolic acid dissolved in oil, one part in twenty, was used as a dressing. The stump suppurated.

On the 8th the patient was feverish.

On the 14th a rash much resembling that of scarlatina

appeared on the skin, her fauces became reddened, and some of her joints were swollen and painful. Her tongue was red, dry, and fissured, and she was delirious at nights.

18th.—She passed black urine, which was analysed by Dr. Stevenson, whose report upon it is contained in ‘Guy’s Hospital Reports,’ series iii, vol. xiii, p. 407.

19th.—Patient insensible. Died at 8.30 a.m.

Post-mortem inspection of the body six hours after death by Dr. Moxon.—There was an excessive crop of miliary eruption; the vesicles were still full of clear fluid. Amputation of right thigh; the stump foul-looking; the bone had a mass of greenish granulations projecting from the medullary cavity to about two lines high. On section this dirty greenish-brown state did not penetrate into the medullary cavity. The medulla was highly injected, as were the little cancellous spaces.

Lungs collapsed very perfectly, some lobules more so than others. In each lower lobe were three or four patches of apoplectic appearance, but without the consistency of apoplectic lung; they were all at the surface, several sharply limited to a lobule.

Pericardium natural. *Heart* weighed 7 oz. Right side contained a small quantity of pretty tough fibrin, with a little black blood beneath. Left side contained a little black blood loosely clotted. At the right end of the mitral, on its auricular face, were excrescences about the meeting line; these excrescences were soft and very easily separated from the membrane, which was here moderately swollen. Many excrescences were rounded and were detached with extreme ease, so that but little more than a touch was required; towards the left end of the mitral the vegetations dwindled down to a mere row of bead-like elevations.

Stomach was much disfigured by bright red-black colouring of its rugæ at its great end.

Liver weighed seventy-four ounces, discoloured by blood decomposition; it was very fatty and coarse-looking.

Spleen soft, weighed ten ounces; had pultaceous contents.

Kidneys weighed eleven ounces, pale pink-yellowish colour: cortex thicker by half than natural. Surface a little rough.

Uterus twice its natural size, evidently not otherwise affected.

Both the shoulder-joints were suppurating. Left knee sup-

purating, contained about two ounces of pus; on opening the joint it was seen that a patch of the subsynovial tissue in the track of the anastomotic artery was in a state of suppuration, causing a sulphur-yellow elevation, with irregular outline. On section this was found to extend to the depth of a quarter to one third of an inch; it showed that this parenchymatous suppuration had preceded the affection of the surface.

Report on Tumour.—The tumour surrounds the lower two fifths of the thigh bone; it extends over a part of the patellar division of the articular cartilage of the condyles. Its surface is smooth and nearly even, but it is raised into large, low, convex elevations, and at a few places is marked with furrows. Section shows the bony part continuous with the shaft of the femur. The marrow canal of the bone is partly, and at points wholly filled up by the inward growth of the tumour, but just above the condyles a part of the canal has almost its natural size; below this, as far as the middle of the condyles, the tumour causes a strongly marked condensation of the spongy interior of the bone, this condensed portion ceasing by a defined sinuous edge (*vide* Plate III).

The greater part of the tumour is composed of dense bone; this forms about three fourths of every section. The bone is in the shape of masses growing away mostly radially from the femur shaft. At the lower end of the tumour the bone so preponderates that it forms seven eighths of the section, the softer part only filling gaps that occur in the otherwise solid osseous masses. At the upper part of the tumour the bone is in stout solid formations, often joining; but the softer part here forms half or even at parts three fourths of the section face. The direction of the bone growth here is more evidently radial, but at the uppermost part it radiates upwards rather than outwards, at acute angles with the shaft of the femur.

The soft part is opaque white, with a very slight disposition to pellucidity; it is firm and elastic to pressure, hard to compression and very tough. At first sight it has a homogeneous appearance, but closer examination discovers radiating bands of tendinous appearance (*vide* Woodcut, fig. 1).

When the microscope is used upon fine sections the radial bands are seen to be very numerous and to be composed of wavy tendon fibres; they appear generally parallel in the field,

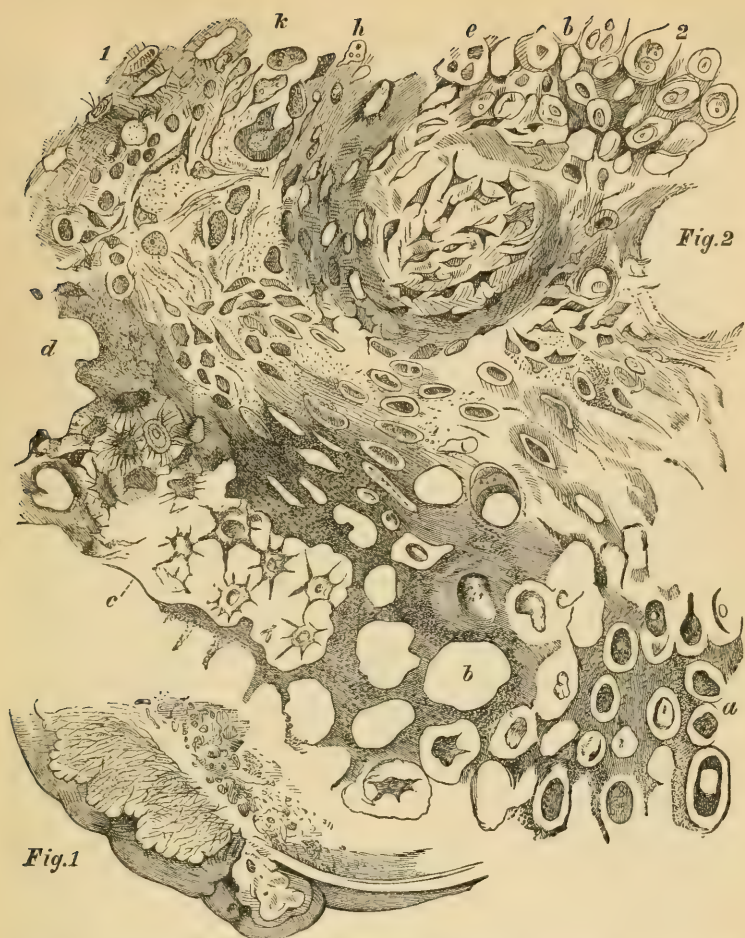


Fig. 1.—Section through condyle of femur, showing ossifying enchondroma growing from the articular cartilage. Natural size.

Fig. 2 represents a portion of the section shown in Fig. 1, highly magnified. At the bottom of the figure is shown ossification of cartilage in the enchondromatous nodule, and at the top is seen ossification of the periosteum continuous with the ossification of the cartilage.

- a.* Hyaline cartilage.
- b.* Calcification of the same.
- c.* Vacuolation of the calcified cartilage.
- d.* Appearance of bone corpuscles in the vacuola walls.
- e.* Tissue which forms the bulk of the tumour, composed of intercellular substance of close-set fibrils, and cells (*b* and *2* at top of woodcut), with nuclei and nucleoli, and occasionally fatty cell contents, but without capsules.

At *h* bone growing into the tissue.

k. Medulla cells.

Those at *1* proliferate and lie along the growing edge of the bone, into which they are then transformed by simple calcification of the intercellular substance.

but some diverge and join, and others open out to be continuous with the intercellular stroma. The stroma consists of closely fitted, generally curled fibrils of different sizes; it forms beds in which are loosely lodged delicate cells with round nuclei, and one or two nucleoli. We failed to be certain of a cell-wall, but a small quantity of soft material was about many of the nuclei; some of these were much larger and showed an endogenous origin of nucleoli; at least as many as twelve of these are present in some large nuclei.

These cells are altered in preparation after being kept in spirit, so that they no longer fall out of their beds to become free in the field of the microscope. In their place are seen glistening nuclei in which a nucleolus cannot be perceived. But a few of the cells still remain, and these show a nucleus and nucleolus, a cell-wall, and fatty cell contents. They appear to be in a state of fatty degeneration. Close to the bony spicules the tissue takes a more regular arrangement, so that in section the cells are found to lie in regular order round the growing bone, lying flat towards its surface as if compressed in its growth, but instead of being thinner from the compression thus suggested by their disposition, the cells and the intercellular material here swell out, and at the same time have a glistening appearance, the cells being elongated, finely jagged on the margins, and, in short, in their disposition and form closely resembling bone-corpuscles. The transformation of the whole into true bone is effected by the deposition of lime granules, during which deposition the canaliculi become distinct (see Woodcut, fig. 2).

Where the tumour overhangs and is connected with the cartilage on the patellar face of the condyles, it appears in the form of a small semi-detached rounded mass in its lowest part. This little mass, the size of a filbert kernel, is composed of hyaline cartilage, more or less ossified, divided into lobes, as in enchondroma.

Microscopic examination of this part shows perfect hyaline cartilage in all stages of transformation into perfect bone according to the normal course of development,—the cartilage matrix becoming calcified and then vacuolated by partial decalcification, so as to form open spaces in and on whose walls lacunar cells develop.

Mingled with the parts undergoing this change are others having all the appearances before described as common to the bulk of the tumour ; and these latter parts undergo ossification from membrane in immediate continuity with the calcifying and ossifying cartilage.

The substance of the tumour would come within the description of ossifying fibro-cartilage. It especially corresponds with the material called "subperiosteal blastema" or "osteoid tissue," from the natural situation of which it grows.

Remarks.—This case is full of clinical interest, and illustrates several very important practical points.

As an example of osteo-chondromatous disease of a bone it is very complete, both clinically and pathologically ; indeed, on that account I have introduced it into this series of reports, having shown the fresh preparation before the Pathological Society in 1867.

In its clinical features the disease manifested its presence in a very insidious way, the single symptom of increase in the size of the affected bone, and as a consequence some slight impaired movement of the joint, alone marking its progress. It began, it was said, after a blow, but the history of the injury was vague, and the time of its receipt remote, for the blow was received in 1861, and no signs of disease appeared till 1864. Under such circumstances it may be a question as to how far the blow had anything to do with the disease, although it must be accepted as a fact that local diseases are prone to follow local injuries.

The tumour showed itself locally as a small immoveable outgrowth from the inner condyle of the femur, and from such a beginning gradually grew till it had involved nearly the lower half of the bone.

When coming under observation the limb in its general appearance was very remarkable, and when compared with the unaffected side was nearly double its diameter. It had a smooth outline and gave no yield on pressure ; the tumour was clearly osseous.

The knee-joint was perfectly sound ; that is, it contained no excess of fluid ; it moved smoothly ; could be extended to the full, but not bent beyond the angle of 130°. The patella was,

however, displaced outwards; in fact, the growth was clearly of a bony kind; it had taken three years to attain its then size, and had produced symptoms which were to be explained mainly from mechanical causes. The growth may be said to have been almost painless, and it in no way affected the patient's general condition.

Now, this history is such as is usually met with in simple tumours of bone, more particularly when those tumours spring from the surface of the bone.

The treatment that was carried out was the only one which suggested itself, or from which any good could be expected; it was, however, based on mere expediency; the disease was apparently not of such a nature as would directly affect the life of the patient, although life's usefulness was clearly interfered with, and would be more so as time went on, and on that account an operation was suggested and performed.

In the operation itself there is nothing special to call for remark; it was so planned as to take away the disease and nothing more, and it was not thought necessary to follow what has been too long regarded as a rule of surgery, to take away the bone which was the seat of the disease at or above its proximal joint, for to have done so would have added largely to the magnitude of the operation and consequently to its danger, and the advantages of the practice are not of such a marked nature as to justify the surgeon in submitting his patient to any extra risks. Indeed, except in clearly cancerous tumours of bone or periosteum, such a rule had better be given up.

The appearance of a rash on the ninth day after the operation is a point to be observed, for it was ushered in by constitutional symptoms of a severe type, and ended eventually after four days in death from blood poisoning, as indicated by suppuration of the joints; the rash also put on much the appearance of scarlet fever. This rash is by no means infrequent in surgical cases, and is generally met with where suppuration exists; it is, however, by no means very common after operation. It is, as a rule, ushered in by some constitutional disturbance and not uncommonly by a rigor; it is not unfrequently attended by sore throat; it lasts about two days and then dies away, the patient generally feeling relieved as soon as the

eruption comes out, and speedily convalescing. The skin at times subsequently desquamates.

The affection is constantly mistaken for scarlet fever.

How far it is to be looked upon as being the result of some slight septicæmic change I am not prepared to state. I have an opinion that such an explanation of its nature is probable, and consistent with what is met with in practice, and would adduce the evidence of the present case as an argument in point, for although the majority of cases having this rash recover speedily, and even without further trouble, in this, death took place, and from the post-mortem record I think it may be said from blood poisoning. The whole matter, however, requires close observation.

I must call attention to the fact also that the wound after the amputation was dressed with a solution of carbolic acid in olive oil, and that as a result black urine was secreted, this case having been one of the first in which melanuria was observed to follow the use of carbolic acid. The urine was, moreover, analysed by Dr. Stevenson, who in an interesting paper to which I would refer the reader concluded "that the pigment is undoubtedly not blood pigment somewhat altered, as is the case with many dark urinary constituents, for the properties of the one reported are widely different. Moreover, microscopical examination merely revealed the presence of ordinary mucous corpuscles, a very few scattered corpuscles (the woman was menstruating), and the amorphous pigment. Nor was this indigo blue, for it had distinctive peculiarities of its own, and no amount of exposure to air and treatment with reagents caused it to assume a blue colour."¹

The connection between the use of carbolic acid and melanuria is now well recognised, but it was not so ten years ago, when the case occurred. It is a point to which surgeons should always have an eye when they use the drug, for in certain cases it may be of immense importance. In two instances in my own practice the recognition of its import has been the means of saving life. In one, a healthy man of middle age had a small wound of the hand dressed with carbolic oil (20 per cent. strength), and after the first dressing he became frightfully depressed, collapsed, and unconscious; twenty hours after the

¹ Vide 'Guy's Hosp. Reps.,' ser. iii, vol. xiii, p. 407, 1867.

dressing he was in a cold sweat, pulseless, unconscious, with fixed, dilated pupils, and apparently dying, and in this condition I saw him. On looking to the urine it was seen to be black. With such a clue the local dressing was removed, stimulating enemata were given, and brandy was poured down the man's throat. Within a few hours signs of reaction made their appearance, the pulse became perceptible, the skin warmer, and consciousness returned, and in another twelve hours the man was convalescent.

Had the nature of the case not been recognised death would undoubtedly have taken place, and pathologists would probably have found within the body sufficient changes to have accounted for such a result without the help of carbolic acid. Indeed, in the case of osteo-chondroma just recorded, in which this melanuria was found, the patient died collapsed and insensible, and it was a question in my mind at the time of her death as to how far poisoning by carbolic acid had to do with it.

At any rate I would ask surgeons to observe their patients closely when using carbolic acid as a dressing to wounds, for I have in several found great nervous depression and semi-unconsciousness to be a direct consequence of its use; and by doing so have doubtless saved life.

In children this caution is most important. In the case of a boy, aged 7, in which a wound, after resection of the head of the femur had been performed, was dressed with a weak solution of carbolic acid (10 per cent.), the child became semi-comatose, and remained so for days. On finding his urine was black this dressing was given up, when the symptoms at once disappeared, and the case went on to a successful result. Had the discovery not been made a very different result would doubtless have had to be recorded.

CASE 4.—Fibrous Carcinomatous Tumour developed in the Shaft of the Tibia; Fracture of the Bone at the Seat of the Disease; Repair of Fracture; Rapid Growth of Tumour; Amputation; Recovery.

(Reported by Mr. LIONEL BOOTH.)

Joseph S—, æt. 66, a sawyer, residing at Limehouse, was admitted into Guy's Hospital under Mr. Bryant's care on July

1st, 1861. He had been a healthy and a steady man, never having had any disease or illness.

He states that his present trouble began five years before his admission into the hospital, when he struck his leg with an axe; the seat of injury became soon affected by a lump which was, when first seen, the size of a nut. It was situated in front of the leg bone at the junction of its middle and lower third, and was quite fixed; the skin, however, could be rolled over it. The tumour caused him no pain except when it was struck.

It gradually increased for about two years, when it was nearly the size of a walnut; it then became more painful, especially after a hard day's work. He had medical advice at this time and applied lotions to the swelling, but they had no effect upon its growth.

About two and a half years ago he fell down a sawpit and broke his leg. The fracture, which was apparently just above the lump, was set, and he recovered, being able to walk. About six months later he came to see Mr. Bryant at the hospital, as the tumour had grown and became much more painful. After a time he became an in-patient under Mr. Bryant's care, and remained in the hospital for three weeks, but he left because he was told he must lose his limb, and to this he would not assent.

The tumour, however, rapidly increased in size and became more painful; exercise also was almost impossible.

Six weeks before admission he fell out of bed and struck his leg against the table; the blow broke the skin over the tumour and the sore has never healed.

Under these circumstances he sought admission.

At the present time there is a large tumour the size of a fist, apparently involving the tibia at the junction of the middle and lower third of the bone; it is raised about three inches above the level of the bone, and has a circumference of nine inches. The skin over it is broken from the injury it had sustained six weeks previously, and the surface of the sore was unhealthy, but the tumour itself was not exposed; manipulation of the growth caused pain; the tumour had a firm fibrous feel, with a smooth nodular outline. The man cannot stand upon the affected limb without the aid of a stick.

There were no enlarged inguinal glands to be felt, and the patient's general condition was good. Under these circum-

stances Mr. Bryant diagnosed a simple tumour involving the shaft of the tibia, and said there was nothing to be done but amputation.

The leg was consequently taken off in July, 1861, amputation above the knee having been selected, and a rapid recovery followed.

The patient was seen a year after the operation, and he was quite well.

Pathological Report of Specimen by Dr. J. F. Goodhart.—The tumour, as may be seen in Plate IV, has taken the place of part of the shaft of the tibia, which has entirely disappeared. The bone is healthy above, then is replaced by the tumour, and below is again healthy. The growth, which is quite distinct from the bone, has a very fibrous appearance, thick bands traversing it in all directions, but in between these a softer material is occasionally visible. The microscope hardly tells us more, excepting that it shows the softer parts to be composed of round nuclei in large numbers, and the individual cells, at the circumference of these collections, are elongated into spindle-shaped cells and fibres. It thus appears that the tumour is essentially fibrous, and that it is still growing rapidly from foci within itself.



Fig. 3.

Fig. 4.

The histological details are sufficiently shown in the accompanying drawings to render any further description of them unnecessary (figs. 3 and 4). But it may not be out of place to

remark that the growth is possessed of considerable interest: 1st, because it is an instance, I take it, of primary scirrhus in bone. All pathologists admit the occasional occurrence of carcinomata in bone, but they are much more rarely primary affections than secondary. But rare as is primary carcinoma a fibrous form such as this is rarer still. 2ndly, though so large and its tendency that of infiltration, it does not appear as yet to have invaded the bone. Its margin is still quite distinct from the tibia, which is in all respects healthy. I am inclined to think that its present isolation suggests a periosteal origin, and I suspect, though there is, as far as I can see, no other corroborative evidence, that it has simply destroyed the bone by its pressure. It is also worthy of note that a tumour so fibrous as this does not yet show any tendency to the formation of bone or calcareous material.

Remarks.—This case has been described as one of hard cancer of the tibia, although in its clinical aspect it presented more the features of a simple tumour, for it was local in its character from the first, showed no signs of infiltration of tissue, was unassociated with lymphatic glandular enlargement, and had been growing for five years.

That its origin could be clearly traced to a blow was nothing unusual, although possibly the cause and effect were more clearly demonstrated in this case than is common in the majority of cases of tumours, for the growth appeared very soon after, and in the exact spot of, a local injury from an axe.

The painless character of the growth is worthy of notice, and tends to support the view put forward by Dr. Goodhart as to its periosteal origin, for had the tumour originated within the bone and expanded its shell it would doubtless have given rise to pain—due to bone expansion—of a dull, heavy, aching kind. The absence of pain consequently became a point of importance, and was enough to suggest the seat of the disease.

The first notice of the tumour becoming painful was in the third year of its growth, when it had attained the size of a walnut, but the pain was then only experienced after a hard day's work, the bone probably at that time having been weakened by absorption of part of its thickness.

The history of the man having fractured his leg about this

time is very interesting, and the fact that the fracture united favorably, as well indeed as if no disease had existed in the bone, was remarkable; although when we look at the preparation and find that there is no disease in the bone itself, no infiltration of the bone with the disease, the fact is explained; for had such a condition existed non-union would probably have resulted with all the consequences so well illustrated in a case published in my last paper on this subject, vol. xx, series iii, 1875.

The more rapid growth of the tumour after the fracture was, however, quite consistent with ordinary experience.

The report further records that the tumour rapidly increased in size and became more painful; it adds also that exercise was almost impossible, although the man could stand with the aid of a stick. On looking at the limb after removal and at the drawing, Plate IV, this paragraph becomes intelligible, although we may well wonder how he managed to stand at all; indeed, it was doubtless by means of the splint bone or fibula that he continued to do so, for he had no tibia to support him, the tumour having caused the absorption of the whole thickness of the bone.

With respect to the treatment that was adopted in this case I have not much to regret if the principle of practice had alone to be considered, for the removal of the growth with the affected bone was doubtless the correct thing to have done, but I must repeat in this case what I have already had occasion to write when commenting upon Case 1, that the better practice would have been an amputation at the knee-joint.

In all other respects the treatment was sound and such as should be followed.

Comment upon the pathological aspects of the case is hardly necessary, Dr. Goodhart's report containing full and sound information upon all points, although I cannot omit to notice how very unusual it is to meet with a cancerous tumour of a bone involving the bone only locally and in no way infiltrating it; in this respect it behaves towards the bone as any simple non-malignant tumour might be expected to do. For in this case, as seen by the drawing, it is clear that the bone had been absorbed simply by the pressure of the tumour. The disease, in truth, was encapsuled and consequently acted as

all encysted tumours do, simply mechanically, the bone being gradually absorbed as a result of local pressure, in the same way as a bone may be absorbed by an aneurism or other local disease causing pressure.

*CASE 5.—Expansion of the Shaft of the Tibia due to a Cyst ;
Trephining ; Recovery.*

(Reported by Mr. HAWTON.)

Henry D—, æt. 24, was admitted under Mr. Bryant into Guy's Hospital on January 6th, 1871, with expansion of the right tibia. It had been gradually coming for nine years. He had seen Mr. Bryant on two occasions during that period, at nine and eight years ago respectively. At times he suffered much pain in it, but usually it did little more than ache after exertion.

He had never had syphilis, nor could any trace of injury be obtained.

On admission, the tibia is much dilated in the middle of its shaft; it is twice the diameter of the other. The surface is much grooved where the cutaneous veins ramify, the channels of the veins being very clear. The integument over the enlarged bone is slightly œdematous. There is a constant aching pain in the part, but pressure does not aggravate it.

On January 13th Mr. Bryant cut down upon the bone over the seat of swelling, and trephined it. He found the periosteum much thickened and the bone diseased. About one inch from the surface a large cavity was opened, which was lined with membrane. No pus was seen, but serum escaped with the blood. The cavity was as large as a large walnut. Water-dressing was applied. After the operation all pain ceased and never returned. The wound healed up kindly, and the man left the hospital nearly well on March 16th; only a slight portion of the wound having to granulate. The tibia had greatly diminished in size.

Three years later Mr. Bryant heard of this man and he was quite well. In 1875 Mr. Bryant saw him and examined his leg, when with the exception of the scar of the old operation

nothing abnormal could be made out, the enlarged bone having contracted to its normal dimensions.

Remarks.—This case is unique in my experience, nothing like it having occurred in the quarter of a century it has been my privilege to know the practice of Guy's Hospital; and whether the disease is described rightly as a simple cyst in bone, or whether it should be attributed to some inflammatory action, I am not quite clear.

In its clinical history it presented all the symptoms of a new growth expanding bone, that is, there was a gradual expansion of bone with an aching pain in the part, aggravated by exertion; and yet these symptoms are quite consistent with an inflammatory action, although there was no evidence of increase of heat or special tenderness in the tissues.

The fact that the bone was grooved upon its surface for the venous channels which coursed over it, was one of interest, and possibly suggested some chronic inflammatory action rather than a mechanically expanded bone, and the œdema of the soft parts covering in the bone tended in the same direction; indeed, it was on these accounts and supported by the probabilities of the case that my diagnosis inclined towards the disease being inflammatory, and with such an opinion I trephined the bone with the expectation of finding a chronic inflammatory cavity lined with granulations and containing pus.

It is true that I did find a cavity which was lined with granulations or with what felt like granulations, and which was filled—if filled at all—with serous blood-stained fluid or blood itself, but neither pus nor other evidence of inflammatory action was present, and under these circumstances the true nature of the case remained in doubt.

That a cavity existed in the centre of the bone was clear, and that that cavity was lined with what felt and looked like granulations was also in evidence; but whether this latter fact is more consistent with the view of the disease being due to the presence of some cyst in the bone, or to the action of some inflammatory process, may be the subject of dispute. For my own part I think the probabilities of the case point rather to the inflammatory origin of the disease than to the presence of

a cyst, for I do not know pathologically of any cyst upon the interior of which anything like granulation tissue is ever found.

I give the case, therefore, as it stands, as a contribution to the subject of tumours in bone, trusting that, as time passes, other links in the chain of evidence will be found to throw light upon its nature and to give it a place in surgical knowledge.

CASE 6.—*Osteo-porosis or Paget's Osteitis deformans.*

(Reported by Mr. J. E. VINEX.)

William F—, a carpenter, æt. 60, was admitted into Job Ward on the 8th April, 1876, under Mr. Bryant's care, having been sent up by Mr. Deeping, of Southend.

He was a married man, and had seven children. When sixteen years old he had a slight attack of gonorrhœa; there was no history of syphilis. At the age of thirty-five he received an injury to his pelvis from a weight which he was carrying. It was too heavy for him, and fell, knocking him down, and coming on his hip. Directly after this he had some trouble with his bladder, which became much distended, and a large quantity of clotted blood was washed out. He lay in bed for six weeks, and at the end of three months he was able to go to work again.

For the last five years he has been troubled with gout, from which his father also had suffered. The attacks were short, and after a few days' rest he always recovered.

In 1873 he first noticed pains of a shooting description about the tendons of the popliteal space whenever he straightened his legs. At this time also he noticed a swelling of his legs, beginning at the ankles. These symptoms continued for about a year. He consulted Mr. Deeping, of Southend, Essex, who tried at different times elastic stockings, knee caps, bathing the legs with hot and cold water, and wrapping them in flannel, but none of these things did good.

For the last year and a half the tibiæ have become much enlarged and curved forwards, and from the pain in them whilst standing he was obliged to give up his work. He could walk

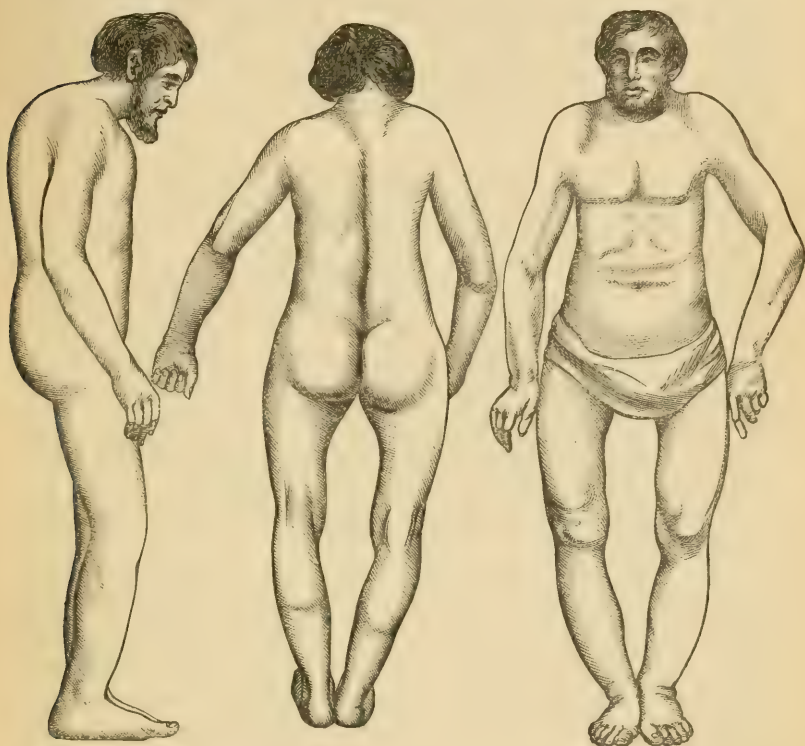
only by the aid of a stick. He did not notice anything wrong with the other bones.

When admitted the tibiæ presented a marked curve forwards. The right tibia was slightly larger than the left, but both were enormously enlarged, and the curve involved the whole length of bone, being very different from that seen in rickets. The anterior borders were rounded to a very marked degree, and could not be felt at all distinctly. The veins above the ankle are in a varicose condition because of the tension of the skin. The patient has cold perspiration over his legs between the ankle and knee-joint in the evening. The fibulæ are also very much enlarged, as are the femora and the pelvic bones. The angle formed by the neck of each femur with the shaft of the bone has much diminished, and the top of the trochanter on both sides of the body touches on measurement the vertical line of Mr. Bryant's ilio-femoral triangle, which means that the neck of the femur is so altered in shape and direction as to produce a shortening of the lower extremity of at least two and a half inches. The patellæ were likewise a little larger than natural. The bursa under the ligamentum patellæ (left) had been enlarged for more than a year. The bones of the upper extremity were enlarged, but not so much as those of the lower. The humeri were most marked, the left being thicker than the right, and he was unable to straighten his arms, probably owing to enlargement of the olecranon. The bones of the scapulæ were very much thickened, the spines and acromions immensely so. The natural curves of the clavicles were very much increased, and the bones thickened, the left being more so than the right. The bones of the hands and feet were apparently normal, as were those of the face. The chest was slightly flattened from side to side; it moved fairly whilst breathing. The ribs on the right side were larger than those on the left. There was a general curve backwards from cervical to dorsal vertebra, so that his usual position in bed was with his head bent forwards and his legs in a semi-extended position. His position when sitting or standing was very peculiar (*vide* woodcut).

Although the patient had not noticed his head getting larger, the bones appear extremely massive, and there is no doubt they also had undergone the same process.

The patient had always been a hard-working man, and had

done a great deal of heavy work on the railway. During the past eighteen months he had a great deal of lime water to drink. This was prescribed by Dr. Warwick of Southend. His urine was 1014 sp. gr., strongly acid; a little albumen; no excess of phosphates.



April 18th, 1876.—During the afternoon he had an orange to eat, and shortly after was attacked with a severe pain above his right hip and over the sacrum. Two linseed-meal poultices were applied, but he could not sleep during the night on account of the pain. Four mustard plasters were then put on, and he was towards morning a little easier, but the pain caught him when he took a deep breath. His appetite was bad, and he was only able to take a little beef tea.

19th.—Pulse hard, normal; temp. normal. Loud systolic bruit heard, loudest at apex of heart, where it was almost a

musical note; the radial arteries were very tortuous and rigid from advanced atheroma. The patient's weight was 11 st. 3 lbs., and his height was 5 ft. 4½ in. He was ordered Mist. Quinæ ʒj t. d. s.

20th.—The pain still continued, and was increased by eating. Pulse 82, very hard. He perspired a good deal, but his temperature was normal. He had no appetite, and was not able to sleep. In the afternoon a dry cupping glass was applied to the part from whence the pain came, and the patient had considerable relief.

24th.—The pain had quite gone, but his back felt weak.

26th.—The patient stated to-day that he had always lived well on a meat and vegetable diet. When he sat down he supported himself with his hands; he was very weak in the legs, which were a good deal bowed; he walked only with the aid of a stick; his eyesight was good. He was ordered to diet himself as follows:—Entire wheat bread, wheat biscuits *ad libitum*, tea, bread and butter, milk half a pint, fat of bacon, stout half a pint, potatoes, rice, butter two ounces.

May 1st.—The patient thought he was much about the same; he fancied the skin over tibia was a little tenser.

4th.—He had pain about his legs, having stood about too long the day before.

11th.—Dr. Pye Smith saw the patient, and reported that, "Beside the enlargement of the bones of the extremities and some emphysema, there was a cardiac murmur, which pointed to incompetence of the mitral valve and probable atheroma, with some obstruction at the aortic opening; the heart is somewhat enlarged in consequence. The cardiac affection has not affected the rest of the body, and may probably scarcely shorten his life."

12th.—His weight was exactly the same as before.

15th.—He left the hospital. The bones did not seem to be still increasing. He was ordered to keep to the same diet.

June 12th.—He came up to see Mr. Bryant. Since his discharge he had been at home at Southend. His weight had increased one pound; there was no apparent change in his condition; he had had less pain in his limbs; his general health was good. Since he has been at home he has found that his head had really increased in size, as a hat which he bought five

years before would not go on his head at all. His head measured in circumference, taken round the occipital protuberance and just above the line of the eyebrows, $22\frac{3}{4}$ inches.

On March 8th, 1877, Mr. Deeping reported that the bones still increase in size, and particularly the cranial bones. The hat which fitted a year ago is to-day too small for him, the increase in the size of the head being due chiefly to the excessive development of the occipital bone. He kept on with the vegetable diet prescribed for six months, but finding no benefit from it gave it up.

Remarks.—This case is a very remarkable one, and presents features which are unlike any known disease. It has already been briefly published with four others by Sir James Paget, Bart., in a paper which was read before the Royal Medical and Chirurgical Society on November 14th, 1876. The author of that paper gave the name “osteitis deformans” to the affection, because in all the recorded examples there was a degeneracy of bone texture, with an increase in its quantity, and this accorded with what was found in inflammation, the gross definition of inflammation being an increased production of imperfect structures.

In a clinical point of view the disease apparently consists in an increased vascularity and a general enlargement of the cranial and most of the long bones of the body, with a certain amount of softening of their texture; this softening accounting for the bending of the bones, the shortening of the necks of the femora, and the diminution in the height of the body. By the same processes the spinal column bends and the curves of the spine become exaggerated.

With this increase in size and softening of the bones pains appear, and these of an obscure kind; they are, as a rule, regarded as rheumatic. These pains are probably caused by the yielding of the softened bones, for they are not experienced when the patients are at rest, but are produced by standing or any exercise. In the case I have described these symptoms were the first to call the patient's attention to his malady.

Beyond these symptoms there are no others of inflammation—no increase of heat, or fever.

The general condition of my own patient was good from the

first, and beyond those troubles, which are to be explained by the changes in the bones themselves, nothing abnormal has been recorded. The mental condition of the man was unusually good.

The position of the patient in sitting and standing was very characteristic; the bowed back, falling head, drooping arms, and bent legs giving a simian aspect which may be called characteristic, and which can hardly be mistaken. These points are well seen in the foregoing woodcuts.

The pathology of the disease is obscure; to say that it is due to an inflammation of the bones is beyond my power, for I cannot quite take in the argument by which Sir James Paget has arrived at that conclusion, but at the same time I am bound to add that I can explain its natural history and course in no better way. That the disease should have ended in three cases out of four in cancer is a fact of importance.

The treatment that was prescribed in this case was based upon no special theory as to the nature of the disease, although it had its origin in a principle; for with the facts before me that the bones were large, porous, and vascular, and, at the same time, soft, I thought that by starving the organic elements and encouraging the deposition of the inorganic I might check growth—check it directly by want of food supply and indirectly by helping the consolidation of the softened bones, and, as a consequence, the closure of the vascular Haversian canals. With such a view entire wheaten bread and biscuits were allowed, with butter, fat bacon, potatoes, and rice, a moderate quantity of milk being allowed and half a pint of beer.

From Mr. Deeping's recent report of the case this treatment was, however, of no avail.

The disease does not luckily appear to be one which seriously involves life, for in Paget's case it had existed for at least twenty years.

DESCRIPTION OF PLATES,

Illustrating Mr. Bryant's Paper on Operative Surgery.

PLATE I.

Periosteal sarcoma growing from condyle of femur. Appearance of limb. Case 2.

PLATE II.

Appearance of tumour in section. Case 2.

PLATE III.

Osteo-chondroma of femur in section. Case 3.

PLATE IV.

Fibrous carcinoma of shaft of tibia. Case 4.



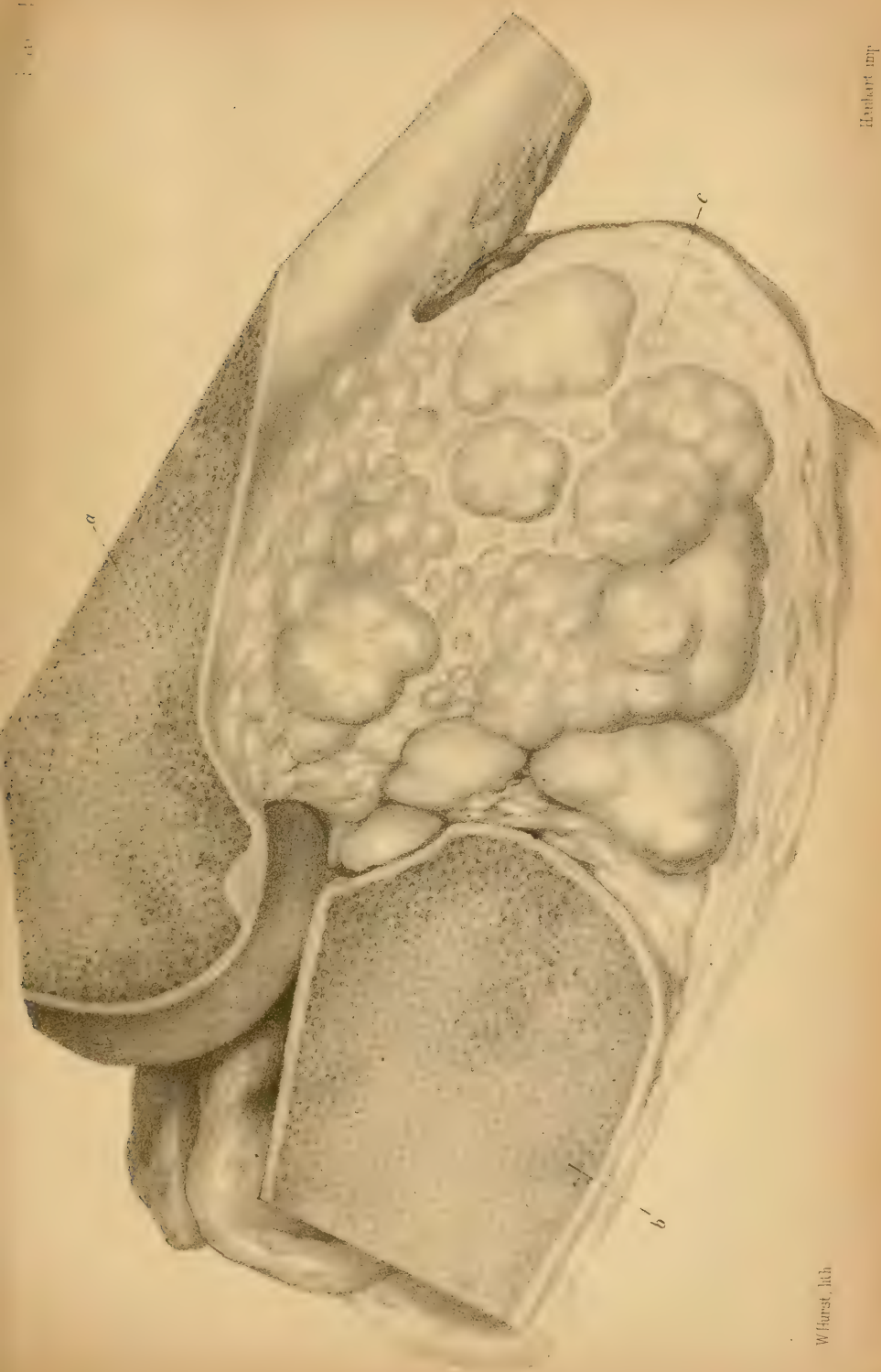
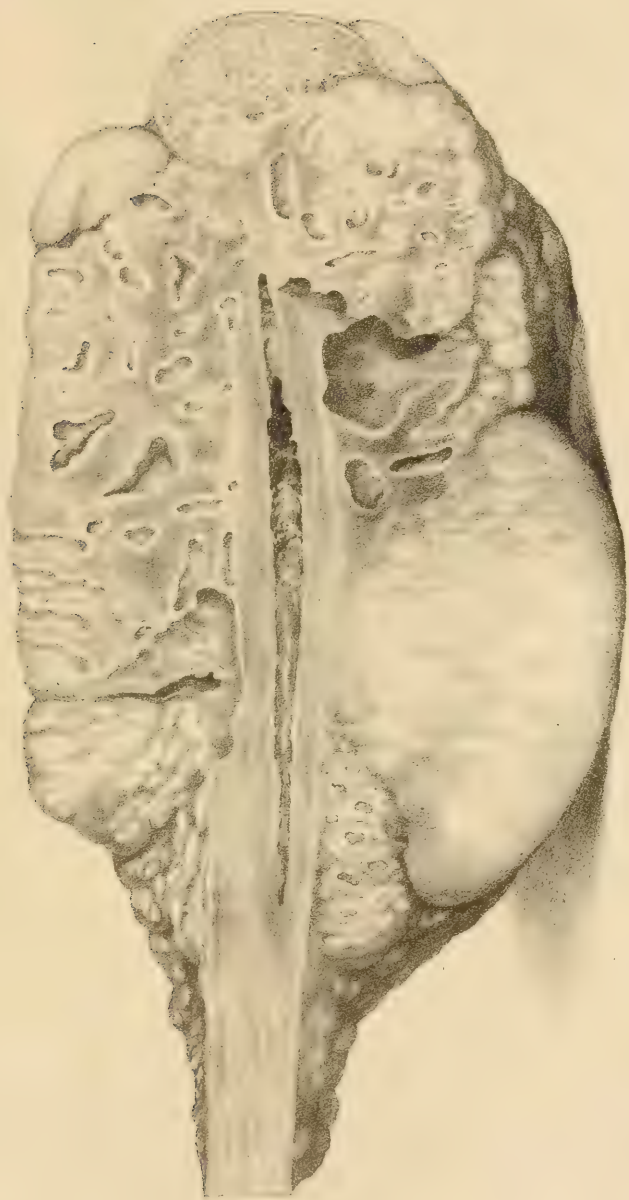


Plate 5





A COLLECTION OF CASES
OF
DIPHTHERIA AND CROUP,
ABSTRACTED FROM THE CLINICAL AND PATHOLOGICAL RECORDS OF
THE HOSPITAL BY
W. H. LAMB, M.B.,
AND COMMUNICATED, WITH SOME OBSERVATIONS, BY
C. HILTON FAGGE, M.D.

At the present time, when medical men in this country are divided in opinion as to the question whether there is a membranous croup apart from diphtheria, and when a Committee of the Royal Medical and Chirurgical Society is endeavouring to supply an answer to this question, it has seemed to me that a summary of the experience of the hospital must be of some value. Accordingly, in the summer of 1876 I asked my then clinical assistant, Mr. Lamb, to collect from the volumes of Medical, Surgical, and Pathological Records, all the cases that he could find of croup or diphtheria or any other allied diseases, and these I now communicate, as they came to me, without selecting or excluding any.

Being a member of the Committee already referred to, I feel myself debarred from offering any lengthy remarks, and from endeavouring to draw a final conclusion with regard to the point at issue. But I may express the opinion that, if there is a membranous croup which is not due to the diphtheritic contagion, its existence must be proved by the collection and comparison of large series of cases, rather than by

detailed pathological investigations, in regard to individual instances, such as would bring to light any histological distinctions between the two diseases. For, if I did not hold such an opinion, I might feel bound to offer an apology for reporting the cases contained in this paper without any details as to the microscopical characters of the affected tissues ; characters which were, indeed, in many instances, left undetermined, but which have in others been very fully described by the successive Demonstrators of pathology, who recorded the cases as they occurred.

My idea of the problem to be solved is, in fact, this : it must be admitted that the diphtheritic poison is capable of giving rise to a plastic inflammation of the larynx, apart from the existence of any similar affection of the pharynx. But there is good reason to believe that during epidemics of diphtheria the cases in which this occurs are in the highest degree exceptional. If, therefore, it can be shown that in the practice of a general hospital the cases of plastic laryngitis, of uncertain origin, bear a large proportion to the total number of cases of diphtheria, there will be a strong probability that the majority of the former cases are dependent upon some other cause than the diphtheritic poison.

Another argument for the independent existence of a membranous croup is one which I believe to have been first used by Dr. Moxon ; namely, that it not unfrequently happens that a plastic laryngitis occurs as the result of injury to the throat from the introduction of boiling water into the fauces, or in other ways. I therefore append notes of the cases in which such an affection has been observed, as also of those in which false membranes have been found in the larger air-passages secondarily to some other disease of the larynx or of the trachea.

Certain minor inferences, bearing upon the main question, can doubtless be drawn from the following series of cases ; but I will leave those to be considered afterwards.

The cases may be naturally arranged in the following classes :

I. THOSE WHICH WERE MORE OR LESS CLEARLY PROVED TO BE CASES OF DIPHTHERIA.

II. THOSE OF MEMBRANOUS LARYNGITIS, OF DOUBTFUL

ORIGIN AS REGARDS DIPHTHERIA, BUT NOT DIRECTLY CAUSED BY LOCAL INJURY TO THE THROAT, NOR SECONDARY TO ANY DISEASE OF THE LARYNX OR TRACHEA.

III. THOSE OF LARYNGITIS, HAVING A CLINICAL RESEMBLANCE TO THOSE OF CROUP, BUT IN WHICH NO FALSE MEMBRANE WAS PROVED TO EXIST.

IV. THOSE OF MEMBRANOUS LARYNGITIS, WITH OR WITHOUT PHARYNGITIS, DIRECTLY CAUSED BY LOCAL INJURY TO THE THROAT, OR SECONDARY TO PRE-EXISTING DISEASE OF THE LARYNX OR TRACHEA.

CLASS I. CASES WHICH WERE MORE OR LESS CLEARLY PROVED TO BE CASES OF DIPHTHERIA.¹

These again may naturally be subdivided into three sections:—

1. *Cases in which there was no evidence that the morbid process extended to the air-passages.*

2. *Cases in which the air-passages were involved, the fauces being at the same time affected to a marked extent.*

3. *Cases in which the air-passages were mainly attacked, the fauces being affected in a very slight degree only, if at all.*

Section 1. Cases of diphtheria in which there was no evidence that the morbid process extended to the air-passages.

CASE 1. *Diphtheria.*—Emma B. G—, æt. 5, Brockley Road, admitted March 13th, 1870, Clinical, Dr. Moxon.

Past history.—Parents have four other children who are well. No evidence of diphtheria in neighbourhood.

March 3rd.—Thought to have caught cold.

5th.—Nose was running, sore and red.

7th.—Throat sore.

8th.—Some white material seen on fauces; throat worse.

10th.—Some pieces of membrane removed on making an application to the throat.

12th.—Throat noticed to be swollen externally. Has taken very little food.

¹ For the present I assume that all cases in which there were false membranes on any part of the fauces were cases of diphtheria. In the sequel it will appear that this may fairly be disputed.

13th.—On admission, looks very ill; nostrils sore and covered with purulent secretion; breath foetid; neck swollen; a thick white membrane seen on both fauces. Urine sp. gr. 1022, albuminous; temp. $100\cdot3^{\circ}$; pulse 140; resp. 38.

14th.—Morning temp. $101\cdot2^{\circ}$; pulse 136; resp. 24. Evening temp. 100° ; pulse 136; resp. 24. Much in the same condition.

15th.—Morning temp. $99\cdot3^{\circ}$; pulse 124; resp. 20. Evening temp. $98\cdot9^{\circ}$; pulse 114; resp. 18. Urine highly albuminous, many granular casts to be seen under the microscope. Breathing obstructed.

16th.—Temp. $98\cdot6^{\circ}$; pulse 132; resp. 22. Evening temp. $98\cdot5^{\circ}$; pulse 144; resp. 24.

17th.—Sank gradually from exhaustion.

Post-mortem not allowed.

NOTE.—From this case the sister of the ward caught diphtheria, which was followed by paralysis of the palate.

CASE 2. *Diphtheria*.—Ann C—, æt. 25, Orpington, Kent, admitted March 15th, 1875, Miriam, Dr. Moxon.

Previous history.—A nursemaid in the same family had diphtheria a week before this girl became ill; she is now recovering; house was badly drained.

On the 12th felt her throat sore.

On the 14th and 15th had great difficulty in breathing and pain in swallowing.

On admission, soft palate and fauces of a bright red colour; both tonsils covered with a dirty white membrane, which is with difficulty peeled off. No albumen in urine, sp. gr. 1030, full of lithates. Temp. $102\cdot2^{\circ}$; pulse 120; resp. 24. Slight glandular enlargement on left side of neck. Purgatives administered.

Temperature and pulse gradually went down, till on the 22nd they were, temp. 98° ; pulse 92; resp. 24. Urine sp. gr. 1030; a slight cloud of albumen noticed for the first time; there was still a slight patch on left tonsil.

23rd.—Tonsils clean; slight difficulty of speech.

24th.—Urine still contains a slight trace of albumen.

26th.—When drinking, fluid regurgitates through the nose.

April 2nd.—Went out to-day quite recovered. Has a peculiar nasal twang of the voice.

CASE 3. *Diphtheria*.—Mary M—, Green Street Green, Orpington, æt. 37, admitted May 5th, 1875, Clinical, Dr. Taylor.

Previous history.—There was one case of typhoid fever in the house where she is cook. There have been three cases of diphtheria there lately.

On March 29th the nursemaid died from paralysis of the heart (?) after diphtheria. The housemaid, Ann C—, was in the hospital here in March and left cured, with paralysis of the soft palate, which still remains (see Case 2). There were no bad smells in the house, their master had the drains all attended to after the death of the nursemaid.

Last Friday night she began to feel ill with sore throat and a lump on one side; in the middle of the night on looking at her throat she observed a patch on one side of the soft palate; tonsils were also swollen.

On admission, on right side of soft palate there is a layer of plastic lymph, which on removal leaves a bleeding surface; the membrane is soon reproduced. There are yellowish sloughs on tonsils and pharynx. Urine sp. gr. 1015; no albumen. Temperature 99.8° ; pulse 100.

May 10th.—There is considerable improvement in the fauces. No membrane or slough anywhere about; still some ulceration of the left tonsil.

16th.—Went out quite well; there was a little thickness in the speech.

CASE 4. *Diphtheria*.—Jane R—, æt. 22, Dulwich, admitted May 15th, 1875, Bright, Dr. Moxon.

Present illness.—On May 10th had a bad headache and could not sleep; subsequently she had sore throat.

On admission, glands at angle of jaw enlarged. Tonsils and uvula inflamed and red, with patches of membrane on them.

15th.—Temp. 102° ; pulse 100; resp. 22. Urine, sp. gr. 1020; no albumen.

18th.—Pulse 90; temp 98.4° ; resp. 20. Albumen in urine.

20th.—Albumen still present in urine. Membrane has become detached.

31st.—Albumen still present. Voice less distinct. She now speaks through her nose; food comes up through her nose when she swallows; she vomits at times.

June 11th.—No albumen in urine, sp. gr. 1012. Voice not so nasal.

14th.—Complains of dimness of sight in right eye.

16th.—Sight not any better. Went out this afternoon.

CASE 5. *Diphtheria*.—Ann C—, æt. 3, admitted June 4th, 1875, Clinical, Dr. Hilton Fagge.

Previous history.—No children suffering from sore throat in the neighbourhood. Brothers and sisters healthy.

On May 27th child fretful; refused food.

June 2nd.—Came to out-patients' room. Argent. nit. applied to throat.

On admission, glands at angle of jaw enlarged; has nasal catarrh; viscid secretion escapes from mouth. Tonsils and uvula covered with false membrane. At the back of pharynx there is a greyish-brown slough, extending down the throat. Has herpes on lips. Urine albuminous, sp. gr. 1010, no casts or blood, is acid, and contains a quantity of pus. Temp. 99.6° ; pulse 140.

8th.—Vomits after medicine and food. Temp. 98.4° ; pulse 120; resp. 24.

10th.—Submaxillary glands very much enlarged and tender. Urine less albuminous, contains uric acid crystals.

11th.—Throat looks better; ulceration on tonsils cleaner.

12th.—Was taken away.

CASE 6. *Diphtheria*.—M. A. M—, æt. 17, admitted into Lydia ward under Dr. Habershon's care, November 15th, 1869. She gave a history of gradual loss of strength and health over a period of some months. She had had amenorrhœa for five months, and had well-marked chlorosis. She complained of sore throat, but not so as to attract special attention to that part. Her prominent symptom was debility, so that she could not sit up in bed even when raised. She had had shivering the day before her admission. There was no albu-

men in her urine. The temperature remained at 102° — 103.5° ; her pulse at 112—124. She became very delirious the day before her death and finally unconscious for some time.

Post mortem.—Back of pharynx was deeply congested, with a thin, very closely adherent membrane, of greyish colour; this did not extend into the œsophagus. The same condition was seen on the edge of the soft palate and uvula, on the anterior surface of the epiglottis, and edge of the glottis; not extending into the larynx. In the large intestine there was the same diphtheritic condition. Kidneys 12 oz., pale, pyramids hardly distinguishable from cortex.

CASE 7. *Diphtheria (?) associated with sloughing of penis.*—Henry E—, æt. 38, admitted February 23rd, Samaritan, Mr. Cooper Forster. Has had syphilis.

On admission, his throat is sore, and there is a large ulcer on uvula and soft palate. He has purpuric rash over his body. The penis is very swollen, red, and infiltrated; anterior part is of a dusky-brown colour, and seems to be sloughing all over; there is a large sore on the front of glans, extending all around. He died on March 8th.

Post mortem.—Membrane in pharynx, also on both surfaces of epiglottis. Soft palate thickened and sloughy looking. Right tonsil had pus in its substance.

CASE 8. *Exophthalmic goitre; diphtheria caught in the hospital from another patient with the same disease.*—Alice W—, æt. 26, admitted June 26th, 1872, Clinical, Dr. Pye-Smith. She was admitted for Graves' disease. Her general health improved until the 21st of July, when she had a shivering fit; shortly afterwards she got very hot, and then perspired freely; felt her throat sore, and was unable to swallow without pain.

July 22nd.—Throat feels sore; the tonsils and uvula are enlarged and very red; complains of great heat and pain in her limbs and back, also in her head. Temp. 102.2° ; pulse 140; resp. 36.

23rd.—Has a patch of grey membrane on and behind each tonsil, which can be taken away with a sponge.

26th.—Submaxillary glands are enlarged and painful.

Patient went out on the 9th September. She had quite recovered from sore throat.

NOTE.—A child had died from diphtheria, under Dr. Pye-Smith's care, in the same ward, on July 20th. See Case 27, of Rosaline P—.

CASE 9. *Diphtheria caught in the hospital.*—R. P—, æt. $7\frac{1}{3}$, was admitted into the Clinical ward on June 27th, 1866, for chorea. Soon afterwards she was attacked with diphtheria of the throat, and died on July 7th.

On post-mortem examination the fauces were deeply reddened and patched with false membranes; there were also two superficial ulcers with defined margins. The larynx was healthy.

NOTE.—The bed occupied by this patient was the same, but doubtless with different bedding, in which a child, æt. 11, had died of diphtheria eight days before. There had been no post-mortem examination of that case, and the clinical report has been mislaid, so that all that can now be learned of the symptoms is that the immediate cause of death was exhaustion, and not any affection of the larynx.

CASE 10. *Diphtheria caught in the hospital.*—Eliz. V—, æt. 23, admitted August 4th, 1876, Clinical, under Dr. Pye-Smith for epilepsy. She continued having fits till August 15th. The report from that time states:

August 15th.—Had no fit last night.

18th.—Has a great number of fits. Complains greatly of her head. Pulse 84; temp. $100\cdot2^{\circ}$.

22nd.—Had a seton passed through her neck on Friday night; has had no relief; pain in her head is worse and extends down to her shoulders. Pulse 84.

23rd.—Took the seton out to-day, she was in such great pain. Her speech is getting very thick, and she is very giddy, not being able to stand. Pulse very small.

25th.—Very giddy, can hardly stand. Pulse 100.

26th.—Has great pain in her head and neck. Had no more fits. Temp. $100\cdot4^{\circ}$; pulse 120.

28th.—Complains of sore throat; pharynx is injected; some of the cervical glands enlarged. Pulse 90; temp. $100\cdot4^{\circ}$. Had a fit last night.

29th.—Throat sore, cannot swallow; tongue white; bowels costive. Pulse 88; temp. $100\cdot2^{\circ}$. Had a fit last night.

30th.—This morning there is a small white patch on left tonsil; patient is in bed. Temp. $101\cdot4^{\circ}$; pulse 100.

31st.—Patch on tonsil has increased in size, extends to uvula; tongue is considerably furred; has great pain; can hardly move her head. Temp. $102\cdot8^{\circ}$; pulse 102.

September 1st.—There is some membrane also on uvula and pharynx now. Pulse 110; temp. 102° ; resp. 26.

2nd.—Large patches of lymph on each tonsil. Temp. $102\cdot4^{\circ}$; pulse 110; resp. 30.

4th.—Can scarcely open her mouth. Temp. 104° ; pulse 128; resp. 28.

5th.—In same condition. Pulse 108; temp. $102\cdot4^{\circ}$.

6th.—Is slightly delirious to-day. Temp. $102\cdot4^{\circ}$; pulse 106.

7th.—Was delirious last night, jumping out of bed. Temp. $101\cdot8^{\circ}$; pulse 100. Is asleep now. Does not take any nourishment; enemata ordered.

8th.—Tongue and throat cleaning; no membrane on uvula now. Temp. $100\cdot4^{\circ}$; pulse 106.

9th.—Patient is doing well now. Very little lymph on tonsils. Pulse 100; temp. $99\cdot8^{\circ}$.

11th.—Temp. $98\cdot4^{\circ}$. No lymph on tonsils.

12th.—Tongue clean. Temp. $98\cdot6^{\circ}$; pulse 88.

15th.—An abscess formed at back of neck.

16th.—Abscess was opened. Continues to improve daily.

21st.—Has not had a fit since August 28th.

October 3rd.—Commenced having epileptic seizures again.

November 29th.—Patient left the hospital to-day much improved.

NOTE.—The diphtheria in this case was distinctly traced to the case of Martha H—, æt. 5, who had died in the same ward a few days before Eliza V— was attacked. (See Case 23.)

CASE 11. *Diphtheria of skin*.—A patient under Dr. Hicks' care in Mary ward was admitted, five weeks pregnant, with albuminuria and dropsy. A few weeks later she aborted spontaneously. After about five days she became feverish and had pain in the lower part of the abdomen. On examination

Dr. Hicks found the fold between the right thigh and the swollen labium covered by a large diphtheritic patch, four inches long by two broad. Although this afterwards became less in extent she grew every day more prostrate, and died of peritonitis ten days after her miscarriage.¹

CASE 12. *Diphtheria of genitals caught in the hospital.*—While the patient whose case has just been referred to was dying, Dr. Hicks removed a fragile calculus from the urethra of a woman who had just been admitted into the same ward. She went on well for about three days, when she complained of tenderness in the urethra, and became feverish. On examination the parts which were abraded were found covered by a diphtheritic layer running up to the bladder. In a few days cystitis came on, and afterwards symptoms of pyæmia, so that she was in a sinking state when her husband removed her to her own home.

CASE 13. *Diphtheria of throat caught in the hospital.*—After the cases just related three other women in the same ward were affected with unhealthy inflammation after operations. At the same time an elderly woman was under treatment for malignant disease of the bladder. She was attacked with severe sore throat, with high feverishness and slight diphtheritic exudation. She recovered from these symptoms, but afterwards died of the cancer.

CASE 14. *Diphtheria of throat caught in the hospital.*—Towards the termination of this series of cases, which all occurred within a fortnight, a woman, aged about 70, was admitted with an ovarian tumour, which was tapped; the opening afterwards discharged fluid which on the third day became offensive. The pulse was about 110 and the temperature 97°. Dr. Hicks examined the throat and found that, although she had no distress there, the whole fauces were covered with a thick diphtheritic layer. She continued to have a cold skin and slow pulse for three days, when she died.

The following cases are introduced for the sake of completeness, but it must be admitted that their clinical value is very doubtful.

¹ See Dr. Hicks' paper in vol. xvi of these Reports, p. 167.

CASE 15. *Double pneumonia; pellicular inflammation of fauces; enteritis.*—Francis S—, æt. 24, a doctor's coachman, admitted under Dr. Habershon into Stephen ward, November 12th, 1868; had been ailing four months. On the Monday before admission had been intensely hot, and on admission had signs of pneumonia. The symptoms increased, he got "prune-juice" sputa, and lastly diarrhœa for two days.

Post mortem.—Larynx healthy. The fauces and soft palate covered with a separable pellicular layer of fibrin, which ceased at least half an inch below the opening of the larynx by an edge whose outline was irregular, with a rounded advancing and receding line, and some rounded patches beyond, where the pellicle could be easily separated, and left the epithelial covering of the mucous membrane perfect and like that around; but in the fauces higher up the removal of the false membrane seemed to leave the corium bare; this removal was, however, exceedingly easy. The soft palate was affected on both sides.

Kidneys fourteen ounces, rather pale and coarse-looking, with stellate veins larger than normal; but the organs were essentially healthy.

CASE 16. *Diphtheria; enteric fever.*—John Mc—, æt. 19, 18, Lisson Street, Edgware Road, admitted February 24th, 1876, under Dr. Moxon in John ward. Has had syphilis. On admission, urine, sp. gr. 1026, yields a thin cloud of albumen. Temp. 103·7°; resp. 36; pulse 112.

February 25th.—A well-marked diphtheritic membrane on fauces. The fever went through its usual course.

March 7th.—Diphtheritic membrane gone from fauces.

He was discharged on April 9th.

NOTE.—While this patient was in the ward, Case 22 occurred.

CASE 17. *Diphtheria of fauces; pyæmia; amputation of arm after injury.*—Geo. F—, æt. 13, admitted January 19th, 1867, Mr. Birkett, Lazarus.

History.—Compound fracture of arm, caused by a dray passing over it.

24th.—Amputation.

27th.—Sore throat; no appetite; fever.

He died on February 6th.

Post mortem.—Abscesses in brain and lungs. Larynx healthy. There was a thick white pellicle over fauces extending down œsophagus nearly to stomach, and there ending in a soft mucus. There was incipient suppuration in calyx of kidney.

CASE 18. *Contracted kidney ; gout ; hypertrophy of heart*.—John J—, æt. 38, admitted December 9th, 1874, Dr. Fagge, Stephen. Died February 11th, 1875.

Post mortem.—Epiglottis œdematous, mucous membrane of pharynx near it inflamed and covered with a thin layer of lymph. Kidneys small.

CASE 19. *Bright's disease ; croupous inflammation of fauces ; softening yellow tubercle in liver and spleen*.—Margaret H—, æt. 16, admitted January 7th, 1874, Dr. Pavy, Clinical. Died February 16th.

February 9th.—Croupy breathing ; purulent discharge at back of pharynx.

11th.—Hæmorrhage from mouth ; membrane coughed up.

Post mortem.—Very slight œdema of aryteno-epiglottidean folds, not sufficient to cause any obstruction. Soft palate had a large membrane upon it, which stripped, leaving the surface beneath normal.

CASE 20. *Lymphoma of lymphatic glands, mediastinal tissue, pleura, liver, kidney, epididymis ; hypertrophy of spleen, œdema glottidis, &c.*—Thomas S—, æt. 12, Dr. Taylor, Clinical, admitted June 25th, 1873.

July 8th.—Tonsils hard, enlarged, and painful.

28th.—Dyspnœa.

August 1st.—Died as if choked.

Post mortem.—Pharynx inflamed and covered with portions of ashy-grey membrane, diphtheritic in character ; no noticeable enlargement of structure of tonsils. Entrance into larynx of a reddish-purple colour and much swollen. Kidneys somewhat mottled, but apparently healthy.¹

CASE 21. *Dysentery ; peritonitis ; diphtheria*.—Emily A—, æt. 34, Dr. Moxon, Clinical, admitted July 3rd, 1872.

¹ This case is published in detail in the 'Path. Trans.,' vol. xxv, p. 246.

On admission pharynx and fauces covered with flakes of false membrane.

Post mortem.—On either side of larynx a mass of greyish substance, apparently diphtheritic membrane (there had recently been a fatal case of diphtheria in the ward, and another patient had caught the disease and recovered). If this was diphtheritic membrane it was remarkably loose, and the mucous membrane beneath must have completely recovered itself; in one part the membrane was adherent. Palate and larynx were quite healthy. Kidneys healthy.

CASE 22. *Diphtheria caught in the hospital.*—Wm. B—, æt. 45, Kennington, Clinical, Dr. Moxon, admitted March 18th, 1876.

18th.—Fell into a tub of water just previous to admission. When admitted he was stone cold, and partially insensible.

27th.—Complains of his throat having been sore since last night. There is a patch of greyish-white membrane above the uvula; there is also a small patch on the left tonsil. Urine pale, no albumen, sp. gr. 1018. He fancied he caught cold last night; had a shivering fit.

28th.—Membrane has not increased. There is much more glandular enlargement on left than on right side.

29th.—Patient this morning has a good deal of erysipelas about the face. Left eye quite closed. Throat much better.

April 1st.—White patches seen on left tonsil, which leave a bleeding surface when scraped off. Temp. $102\cdot2^{\circ}$; pulse 86; resp. 32.

The patient gradually recovered. No albumen in urine at any time. He left the hospital on April 9th.

NOTE.—The patient whose case forms Case 16 was in the same ward during the whole of W. B—'s stay there.

Section 2. Cases of diphtheria in which the air-passages were involved, the fauces being at the same time affected to a marked extent.

CASE 23. *Diphtheria; plastic inflammation of pharynx, larynx, and trachea; bronchitis; collapse of lung.*—Martha

H—, æt. 5, Dr. Fagge, Clinical, admitted August 13th, 1876, died August 18th. The child had been ill a week with febrile symptoms and catarrh. When admitted spots were seen on tonsils and pharynx; she suffered from extreme dyspnœa; the urine was albuminous. Tracheotomy was performed, relief was very great, and it seemed probable on the 16th and 17th that the child would do well. It was afterwards learnt that the child had been in a house where another had died of diphtheria.

Post mortem.—The posterior wall of pharynx was most extensively covered with a whitish-grey, pearly, nearly adherent layer of granular membrane. This could not be picked off with the edge of the knife. The posterior angle of the nasal septum seemed also to be covered with a similar membrane. Larynx lined with false membrane in its whole length; this over the epiglottis was firmly adherent; towards the vocal cords it could just be scraped off with a knife; it left the mucous membrane rough. Below the vocal cords it had completely detached itself. There were some loose pieces of lymph in the larger bronchi. Mediastinal glands not distinctly swollen.

NOTE.—To this case, Case 10 seemed clearly traceable.

CASE 24. *Diphtheria affecting pharynx and larynx.*—Harriet J—, æt. 2½, Wandsworth Road, London; Clinical, Dr. Fagge. Admitted August 8th, 1876. Was taken ill on Thursday with slight spasmodic cough; was worse during the night; suffocating spasms came on every few minutes, accompanied with slight hooping. There had been no diphtheria or hooping-cough about the place. On admission, throat cannot be seen; child has spasmodic coughing every few minutes. Pulse 120; temp. 100·4°. At apices of both lungs mucous crepitant râles.

9th.—Is much worse this morning; urgent dyspnœa. Temp. 101·1°; pulse 140. 12.20 p.m.—Tracheotomy performed; child died ten minutes after.

Post mortem.—Membrane found in larynx and pharynx. Lungs collapsed.

CASE 25. *Diphtheritic laryngitis.*—Elizabeth B—, æt. 1¾, admitted August 30th, 1875, Dr. Taylor, Addison. Had hooping-cough; ricketty. Fourteen days previous to admission had

cold and croupy cough. Ten days before admission one of her sisters died of diphtheria. When admitted had no laryngeal symptoms at all.

September 2nd, 2 a.m.—Woke up with a bad cough. When examined at 4 p.m. there were patches of whitish membrane on the soft palate between uvula and tonsil; dyspnœa marked; cough croupy. Tracheotomy performed at 10 p.m.

3rd.—Temp. $102^{\circ}8$; resp. 60; pulse 180. Temperature continued high. Slight trace of albumen. Died September 4th.

Post mortem.—Cervical glands enlarged at angle of jaw. Membrane firm and tenacious in small bronchial tubes. Small ulcerations on uvula and free edge of soft palate. No membrane here or in pharynx. Ulceration on epiglottis, which was inflamed, red, œdematous. Trachea was covered with creamy material; on removing this the mucous membrane appeared; it was absent below. At bifurcation of trachea there was a distinct membrane, which extended far into bronchi.

CASE 26. *Diphtheria of pharynx and larynx.*—Sarah C—, æt. 24, Long Lane, Clinical, Dr. Taylor, admitted September 15th, 1873. Ten days before admission had sore throat, attributed to getting wet through. There were no cases of sore throat in her neighbourhood. Has had rigors.

On admission great dyspnœa, and blueness of face and hands. Temp. $102^{\circ}4$; pulse 154. The tonsils and uvula were very red, covered irregularly by white, loose, milky-looking secretion. A shred adherent to uvula was dirty white, firm, thick, and more closely resembled diphtheritic membrane than the material on the tonsils. With the laryngoscope the epiglottis and aperture of the larynx were seen to be bright red, velvety, not very œdematous, with the same secretion as on the tonsils. The glands at the angle of the jaw were not swollen. The front of the neck below the jaw was swollen, rather tense, the œdema reaching down over the sternal notch on to the chest. Urine albuminous.

16th.—Tracheotomy was performed.

17th.—Died.

No post-mortem examination was allowed.

CASE 27. *Diphtheria of palate, larynx, trachea, and sto-*

mach ; *pneumonia*.—Rosaline P—, æt. $4\frac{1}{2}$, admitted July 16th, 1872, Dr. Pye-Smith, Clinical.

On admission, has recently had measles and scarlatina. Taken ill on 14th with headache, coryza, cough ; said to have had the cough more or less since birth ; breathing rapid ; patches of ulceration on tonsils. Temp. $101\cdot2^{\circ}$; pulse 130 ; resp. 30. 10.30 p.m., tracheotomy.

19th.—Albumen in urine.

Death occurred on the 20th.

Post mortem.—Soft palate covered with ashy-grey lymph ; some separable without much difficulty. In right tonsil a cavity, would have held a pea, lined with lymph ; margin rounded ; appeared old. Base of tongue and entrance of larynx similarly affected ; disease did not extend into œsophagus beyond just the entrance of larynx. Whole larynx was affected, being lined with the same grey rugged lymph. On left side, below vocal cord, was a small excavated ulcer. Trachea presented lymph in slight degree. Bronchial glands swollen and enlarged. Part of œsophagus was healthy. In the stomach, within a radius of two and a half inches from cardia, there was a number of small ulcers, some with a thin membrane on them similar to that in throat. Kidneys healthy, but congested.

NOTE.—From this case the disease spread to another patient (see Case 8).

CASE 28. *Diphtheria*.—Annie G—, æt. 4, Dr. Habershon, Esther, admitted September 3rd, died September 4th, 1867. One of four children attacked with diphtheria, all of whom died. No further history was taken.

Post mortem.—Cervical glands enlarged. A thick false membrane, easily separable, extended down larynx and trachea. There was nothing like organic union between it and mucous membrane ; mucous membrane rough ; false membrane on fauces, both surfaces of soft palate, and pharynx. It could not be thought that the membrane had extended from pharynx to larynx, as the mucous membrane of the former was nearly all clear. Kidneys congested.

CASE 29. *Diphtheria of pharynx and larynx*.—Richard

R—, æt. 39, Dr. Gull, John, admitted March 22nd, 1862. Was taken ill two days before admission. Had lost two children with diphtheria. (Coachman to Mr. Duke, of Kennington.)

On admission, membrane on pharynx. Urine albuminous ; casts.

Post mortem. — Pharynx, back of tongue, nostrils, and larynx had been affected. All these surfaces were excoriated, and exuded a purulent mucus. Tonsils enlarged, soft, sloughy ; on part of soft palate a thin membrane. Walls of pharynx thickened by inflammatory exudation. Muscle appeared red and swollen. The epiglottis and glottis were swollen, and presented raw surfaces in parts. Air-passages showed more or less plastic inflammation throughout. On vocal cords and in trachea were small pieces of membrane with purulent material. The pus extended into small tubes. Lungs congested, spotted as if apoplectic. In left lung patches of hepatisation, surrounded by hæmorrhage. Kidneys congested. Under the microscope they were seen to be acutely inflamed, the tubules being filled with dark albuminous products.

CASE 30. *Diphtheria of pharynx and larynx.*—Josephine B—, æt. 16 months, Clinical, Dr. Pye-Smith, admitted May 20th, 1874, and died the following day.

On admission, great dyspnœa. Over the soft palate and uvula can be seen a pale yellow membrane. Child was placed in a tent and Vin. Ipecac. given to vomiting. Tracheotomy was performed, and the child obtained relief. Temp. $103\cdot8^{\circ}$; pulse 190 ; resp. 44.

Post mortem.—Epiglottis thickened, injected, with a thin layer of lymph on it. Larynx and trachea full of brownish pus. On washing this a thin layer of membrane remained, which was easily detached. Mucous membrane of fauces, tonsil, uvula, &c., was all of a yellowish hue, not from distinct exudation, but from thickened and changed epithelium. Kidneys healthy.

CASE 31. *Diphtheria of pharynx and larynx.*—Charlotte R. B—, æt. 2 years 4 months, Dockhead, Miriam, Dr. Wilks, admitted November 21st, 1873. Six days ago became hoarse, then had dyspnœa and cough.

On admission, temp. 100.8° ; pulse 150; resp. 44. In the afternoon tracheotomy was performed. Evening temp. 104.8° ; pulse 180; resp. 66.

November 22nd.—Died at 2 a.m.

Post mortem.—Complete layer of lymph on right tonsil; could easily be separated, leaving the surface entire; another patch on the lateral and posterior walls of pharynx. The whole larynx was stuffed full of lymph, closely adherent to vocal cords; whole trachea was lined with lymph, easily removable; mucous membrane was congested. Bronchial glands large, soft, and swollen. Kidneys healthy.

CASE 32. *Diphtheria affecting larynx.*—Ellen J—, æt. $10\frac{1}{2}$, admitted December 18th, 1860, died 20th, Dr. Rees, Miriam. Spots on skin, hæmorrhage from bladder and bowels. Throat affected. Died suddenly. Had been ill ten days. Three other children in the same house had died with similar symptoms. Scarlatina in neighbourhood.

Post mortem.—Pharynx sloughing. One tonsil enlarged from effusion of blood in substance. The same condition affected upper part of larynx and vocal cords. Both sides of epiglottis and vocal cords covered with lymph; below healthy. Lungs healthy. Kidneys healthy. Ecchymoses in various organs.

CASE 33. *Diphtheria of tonsils and respiratory passages.*—Emily R—, æt. $5\frac{1}{2}$, admitted October 19th, 1873, Miriam, Dr. Habershon.

Previous history.—Is an only child, had wheezing come on two days ago; no history of playmates having croup.

On admission, has difficulty of breathing. Temp. 99.8° ; pulse 160; resp. 66. There is a white patch on the right tonsil. At 10.30 p.m. tracheotomy was performed. There was relief to the breathing.

23rd.—Died.

Post mortem.—Larynx lined with inflammatory products from epiglottis downwards, membrane separable very easily. There were thick masses of the same material on the whole laryngeal surface of the wound. Membrane extended into both bronchi. There were a few small patches of lymph on

pharynx and right tonsil, separable with less ease than from the larynx.

CASE 34. *Diphtheria of fauces and larynx*.—Thomas F—, æt. $2\frac{1}{4}$, admitted June 2nd, 1869, Dr. Moxon, Clinical. Died the same day. Ailing four or five days; brought in a dying state; tracheotomy.

Post mortem.—False membrane from posterior nares down the back of soft palate, round uvula, in fauces, on tonsils, down as low as cricoid, and no lower, then over epiglottis to larynx, where it filled up the passage to larynx, then down the trachea, as low as bifurcation. It was easily removed in trachea, with difficulty in larynx; on fauces it stuck so tightly that it could not be got off without injury to surface.

CASE 35. *Diphtheria of fauces and larynx*.—Amelia Mc—, æt. 4, Petersham, Dr. Pavy, admitted October 18th, 1872.

Previous history.—Two days ago mother noticed that it was in a fever, with some perspiration and great difficulty in breathing.

On admission, there is a loud wheezing, with both expiration and inspiration, and a clear ringing cough, with loud crowing inspiration. There is a yellowish-white membrane at back of fauces. Temp. 102° ; pulse 150; resp. 50. At 1.30 tracheotomy was performed, to the immediate relief of the child.

19th.—Temp. 105° ; pulse 116; resp. 36. Evening temp. $102\cdot9^{\circ}$; pulse 152; resp. 30.

20th, 11 a.m.—Temp. $100\cdot8^{\circ}$; pulse 136; resp. 32. Each time the canula is withdrawn there is a deposit of lymph on it, which when washed away with water forms a distinct cast of the tube.

22nd.—Spits up blood and mucus, with a few shreds of membrane. 11 a.m., temp. 103° ; pulse 100; resp. 32. 9 p.m., temp. $100\cdot7^{\circ}$; pulse 152; resp. 40.

26th.—Fits of coughing come on every half hour, they are very slight, and hardly disturb the child. There is a small patch of membrane on the left tonsil.

30th.—Tracheotomy tube was removed.

November 20th.—Patient left well.

CASE 36. *Diphtheria of tonsils and larynx*.—Emily F—, æt. $2\frac{1}{2}$, admitted November 14th, died December 17th, 1872, Dr. Habershon, Miriam. A month ago swallowed with difficulty.

Tracheotomy. Resp. 32; temp. $101\cdot3^{\circ}$; pulse 140. No albuminuria.

Post mortem.—Entrance of larynx swollen, patches of lymph in larynx and tonsils. Kidneys healthy, congested.

CASE 37. *Diphtheria*.—James M—, æt. 3, Mary, Dr. Wilks, admitted July 21st, 1869.

Previous history.—On July 18th his mother noticed that he was continually dribbling, and thought it was his teeth. On the 19th his skin was hot, and he had a croupy cough.

On admission, there is great dyspnœa. There is some exudation on and behind the right tonsil and uvula. Has a cough. Temp. $100\cdot8^{\circ}$; pulse 120; resp. 32.

21st.—Passes his water under him.

22nd.—Tracheotomy performed.

24th.—Died.

CASE 38. *Diphtheria of palate and larynx*.—Richard H. B—, æt. $2\frac{3}{4}$, Dr. Moxon, Clinical, admitted July 7th, 1876. Dyspnœa. Tracheotomy.

Post mortem.—False membrane in fauces, soft palate, tonsils, larynx, trachea, and bronchi, could be drawn out easily in casts from bronchi and their divisions, and was not adherent to mucous membrane. Cervical glands enlarged. Kidneys congested; excess of epithelium in tubes.

CASE 39. *Diphtheria of pharynx and larynx*.—Sarah C—, æt. 18, admitted April 14th, 1865, died 15th, Dr. Rees, Esther.

Post mortem.—Body that of a stout young woman. Soft palate, tonsils, pharynx, covered with patches of false membrane, which gave a fœtid odour. The epiglottis, larynx, and trachea were covered with a firmly adherent continuous layer of lymph. Lungs congested, surface ecchymosed, lobular pneumonia.

CASE 40. *Diphtheria of pharynx and larynx*.—Wm. W—,

æt. 6, Dr. Gull, John, admitted March 19th, 1864, died 20th. Tracheotomy on admission; lived several hours.

Post mortem.—Tonsils swollen; from lower parts of tonsils membrane continuous to epiglottis. Membrane on both aspects of epiglottis and in larynx and trachea. Lungs congested, a little lobular pneumonia.

CASE 41. *Diphtheria of pharynx and larynx.*—Joseph M—, æt. 4½, Dr. Rees, Esther, admitted April 14th, 1863, died April 15th. Had symptoms of sore throat and croup for a week.

Post mortem.—False membrane firmly adherent on tonsils and soft palate; mucous membrane congested. There was a layer of false membrane on epiglottis, larynx, vocal cords, and trachea; this was easily separable; mucous membrane was pale beneath. Lungs: purulent fluid in bronchi; caseous mass, size of a marble, in lower lobe of lung; no tubercle.

CASE 42. *Diphtheria.*—Wm. M—, æt. 29, Petersham, Mr. Birkett, admitted August 7th, 1861, died August 8th.

Post mortem.—Tonsils enlarged, covered with false membrane as thick as a shilling, very fœtid ulcers around. Membrane extended down larynx into trachea and bronchi, and was lost in purulent mucus. Lungs congested. Kidneys of a deep colour.

CASE 43. *Diphtheria, with scarlatina, pyæmia, albuminuria.*—Emma N—, æt. 26, Dr. Payy, Miriam, admitted February 28th, died March 1st, 1872.

Post mortem.—Larynx œdematous, surface covered with diphtheritic kind of membrane; two ulcers; fauces purple, injected, diphtheritic; kidneys congested.

CASE 44. *Cystic carcinoma of ovaries. Plastic laryngitis and pharyngitis, caught in the hospital.*—Jane C—, æt. 41, Dr. Pavy, Addison, admitted November 6th, 1873, died January 26th, 1874.

Post mortem.—Thick membrane on epiglottis; extended from pharynx through larynx and trachea into smaller bronchi. Mediastinal glands enlarged. Kidneys healthy.

CASE 45. *Diseased spine. Diphtheria, caught in the hospital.*—George S—, æt. 16, Mr. Cock, Naaman, admitted March 21st, died April 10th, 1862. Abscess in back, which was opened. Died from diphtheria.

Post mortem.—Double psoas abscess. Palate, pharynx, and exterior of glottis were covered by a false membrane, which on removal left a red surface. Glottis and epiglottis were swollen; membrane was continuous over them from throat; membrane extended as far as vocal cords. Trachea, bronchi, and lungs healthy.

CASE 46. *Diphtheria of pharynx and larynx, caught in the hospital.*—Clara H—, æt. 14, Dr. Moxon, Bright, admitted October 18th, 1874. In Dorcas some months previously for talipes equinus.

History.—Her throat became sore a few days before she was transferred. There had been a similar but less severe case in the ward (Dorcas) just before. When admitted into Bright, her throat was swollen and tender; she could swallow liquids only. Throat presented a sloughy, greyish-looking membrane, which could be peeled off, leaving a raw bleeding surface. This was formed again during the night, more dense than before; she then coughed up a tubular cast of membrane. Urine 1022; large quantity of albumen. Temp. 100·4°.

October 23rd.—Died exhausted.

Post mortem.—Epiglottis injected; epiglottic folds injected and œdematous; laryngeal surface of epiglottis healthy. Vocal cords injected and ragged from ulcerations on both sides. The laryngeal aspect of thyroid had two small, symmetrically placed, thin flakes of membrane; and a rough velvety state of trachea without any membrane extended to bifurcation. Soft palate injected and swollen; tonsils large; no disease nor membrane.

CASE 47. *Diphtheria of pharynx and larynx, caught in the hospital.*—Henry H—, æt. 42, Mr. Cock, Accident. Admitted August 10th, 1864, for compound fracture of leg. Amputation was performed; stump healed; patient remained in a feeble condition. A few days before death became very ill; cause was not very apparent till he was found to have a

diphtheritic throat. He made no complaint, but rapidly sank, and died November 26th.

Post mortem.—Palate, tonsils, and pharynx, down to œsophagus, covered by false membrane. The glottis was quite closed by œdema. A membrane began below vocal cords and continued down trachea into bronchi; it formed a complete lining to air-passages, and was not continuous with membrane in pharynx. A large abscess in left thigh; os femoris laid bare. Lungs congested. Commencing lardaceous change in liver and spleen. Kidneys in first stage of nephritis. Urine in bladder highly albuminous.

Section 3. Cases in which the air-passages were mainly attacked, the fauces being affected in a very slight degree only, if at all.

CASE 48. *Diphtheria; tracheotomy; artificial respiration; death.*—Clara H—, æt. 18 months, Bermondsey, Clinical, Dr. Taylor, admitted September 1st, 1876. Child has not been well for several days, difficulty of breathing came on the day before admission. It did not begin with sore throat. No history of contagion. 4.15. p.m.—Much dyspnœa, with sinking-in of chest; white patches on tonsils, tongue, and labia minora. 5 p.m.—Dyspnœa increased; cough croupy. 5.30 p.m.—Tracheotomy, death.

Post mortem.—Membrane on larynx. Membranes with superficial ulceration on labia minora.

CASE 49. *Diphtheria of tonsils and larynx.*—Eliz. D—, æt. 12 months, Avenue Road, Camberwell, Dr. Pavy, Miriam, admitted January 9th, 1875.

Previous history.—Three days ago was taken with cold and violent cough. Yesterday had great dyspnœa.

On admission, tonsils are enlarged; tongue red; no lymph on palate; tracheotomy performed.

January 10th.—Temp. $102\cdot4^{\circ}$; pulse 160; resp. 56.

11th.—Resp. 76; has had convulsions. Died at 5.30.

Post mortem.—The tracheotomy wound was ash-coloured; surface was coated with a granular layer; recent pleurisy. The

epiglottis was covered on both its surfaces with a soft layer of yellowish false membrane. Isolated patches of the same existed upon the tonsils, also present on the whole interior of larynx down to tracheotomy wound, and to an inch below; here it presented an irregular mass which greatly obstructed the channel, terminating below abruptly. Rest of passages normal. Bronchial glands inflamed. Kidneys healthy to eye, epithelium granular under microscope.

CASE 50. *Diphtheria of trachea, spreading to tracheotomy wound.* — Mary R—, æt 4½, Borough, Southwark, Clinical, Dr. Moxon, admitted March 5th, 1875.

Previous history.—No other cases of croup in family. Fourteen days ago caught cold and had hoarseness. Last night dyspnœa came on.

On admission at 1 p.m., walked into the ward. At 4 p.m. breathing became more difficult and noisy, there was more lividity of face. Tracheotomy was performed and the breathing became free. 7 p.m.—Temp. 101·8°; pulse 160.

March 6th.—Temp. 100·8°; pulse 140; resp. 32. On removing the tube a plug of membrane was expectorated.

7th.—Temp. 102·8°; pulse 192; resp. 28. Again expectorated membrane.

8th.—Morning temp. 102·1°; pulse 164; resp. 56. Evening temp. 103·4°; pulse 160; resp. 39. Masses of membrane and mucus were expectorated.

9th.—Temp. 102·4°; pulse 142; resp. 44. Around the opening in the trachea there is a kind of diphtheritic membrane, and the skin for some distance is of a bright red colour.

10th.—Died at 10 a.m.

Post mortem.—Whole tracheal surface was covered with yellow slime, which came off in shreds and flakes. Mucous membrane was very rough, vascular, and had minute ecchymoses. Rings against which tracheotomy tube had rested were exposed by ulceration of the mucous membrane. No membrane could be found in any part save the trachea.

CASE 51. ? *Diphtheria, affecting epiglottis chiefly.*—Thomas A—, æt. 1½, admitted April 22nd, 1871, Dr. Pavy, Miriam. A week ago had fever and sore throat.

22nd.—Great dyspnœa. Pulse 128; resp. 40; temp. 102·4°.

23rd.—Tracheotomy and death.

Post mortem.—A few patches of lymph on laryngeal surface of epiglottis. Mucous membrane of larynx, trachea, and bronchi swollen. In right tonsil small extravasations of blood, no membrane.

CASE 52. ? *Diphtheria, affecting larynx and tonsil.*—Thomas K—, æt. 3, admitted September 9th, 1874, Clinical, Dr. Taylor.

Present illness.—Last night was taken with a croupy cough.

On admission, occasionally has loud crowing inspiration and cough. Was placed in a tent, and Vin. Ipecac. was given till vomiting was produced. Temp. 100·4°; pulse 120; resp. 36.

September 10th.—There is a white patch on left tonsil. 8 p.m.—Tracheotomy was performed; obtained some relief.

12th.—Temp. 99·9°; pulse 144; resp. 38. Urine sp. gr. 1030, albumen one sixth.

The tube was removed about the 20th. The wound closed shortly afterwards, and the child was discharged cured on October 31st.¹

CASE 53. ? *Diphtheria, affecting the larynx, and slightly the tonsils.*—Alice D—, æt. 3½, Clinical, Dr. Owen Rees, admitted October 18th, 1872.

Previous history.—A week ago got wet and caught cold, complained of pain in the face and coughed. Two days ago would not take her food, and breathed with difficulty; at times the dyspnœa was most severe.

On admission, at 1 p.m., dyspnœa was so urgent that tracheotomy had to be performed. Pulse 132; temp. 100·4°; resp. 44.

Died on the 20th.

Post mortem.—False membrane in larynx, adherent to vocal cords; in parts could scarcely be stripped off. Tonsils swollen; patches of lymph about them.

¹ This case has been recorded in the volume of these Reports for 1875 p. 513.

CASE 54. ? *Diphtheria, affecting the larynx, and slightly the pharynx.*—James D—, æt. 2, admitted September 18th, died September 19th, 1872, Dr. Fagge, Clinical.

Child died while tracheotomy was being performed.

Post mortem.—The laryngeal aspect of the epiglottis was covered with whitish membrane, tough, and with difficulty detached. This extended down the larynx and trachea. Mucous membrane injected. Tonsils both rather worm-eaten-looking and ulcerated; ulcers had thick indurated bands, did not look recent. There was a slight membrane over posterior aspect of pharynx and about tonsils.

CASE 55. ? *Diphtheria, affecting the air-passages and slightly the tonsil.*—Alfred F—, æt. $4\frac{3}{4}$, admitted July 10th, 1871, dying, Dr. Fagge, Clinical. Has been ailing since 3rd of July.

On 8th had difficulty of breathing.

10th.—Tracheotomy; lived ten hours.

Post mortem.—A thick, tough, false membrane from entrance of larynx down to bronchi; separated readily; no pus. Mucous membrane pink-red; a small patch of membrane on tonsil.

CASE 56. *Diphtheria, affecting larynx and slightly the tonsil.*—Henry W. B—, æt. 7, Miriam, Dr. Owen Rees, admitted October 21st, 1867. Tracheotomy was performed on the morning of admission. 5 p.m.—Pulse 160; resp. 36.

October 22nd.—Has had several attacks of dyspnœa this morning. Several pieces of false membrane have come away through the tube.

23rd.—Another large piece of membrane came away in the form of a tube. Pulse 150; resp. 40. Died at 10 p.m.

Post mortem.—On tonsil false membrane not removable without abrasion; membrane in larynx, trachea, and bronchi easily separable. Cervical glands enlarged.

CASE 57. ? *Diphtheria, affecting the larynx chiefly.*—James C—, æt. 5, Clinical, Dr. Taylor, admitted August 28th, 1874, died the same day.

Previous history.—Parents have two other children who are healthy; neither has suffered from croup. Patient has had cough for five days; this increased in severity yesterday.

On admission, has cough, suffers from dyspnœa, breathing is stridulous. Tonsils are enlarged, and have a grey layer of exudation on their inner surfaces; glands in neck enlarged. Temp. 102° ; pulse 160; resp. 28. Tracheotomy was performed during the afternoon.

Note by Dr. Taylor.—"The tonsils when I saw them had not the appearance usual in diphtheria; they were large, firm looking; neither so pale as in mere chronic enlargement, nor so red as in acute inflammation. They appeared to be old enlarged tonsils, slightly inflamed; there was no exudation or membrane on them."

Post mortem.—Tonsils enlarged, left contained a little pus. Upper part of larynx filled with a detached mass of membrane, extending down to true cords; not below. It might have been easily removed. A little blood clot below tracheotomy wound. No inflammation of lungs.

CLASS II. CASES OF MEMBRANOUS LARYNGITIS OF DOUBTFUL ORIGIN AS REGARDS DIPHTHERIA, BUT NOT DIRECTLY CAUSED BY LOCAL INJURY TO THE THROAT, NOR SECONDARY TO ANY OTHER DISEASE OF THE LARYNX OR TRACHEA.

CASE 58.—Henry T—, æt. 14 months, Bermondsey, Clinical, Dr. Habershon, admitted October 28th, 1875.

Previous history.—Got wet through two weeks ago; has had a cough since; ran about till 27th. Two nights ago became worse, with rattling in throat; mother thought he would choke. At 4.30 yesterday afternoon began to suffer from intense dyspnœa, and was brought to the hospital. No false membrane could be discovered on the fauces; tracheotomy was performed.

October 28th.—Temp. 103° . 9 p.m.—Temp. 103.5° ; pulse 180; resp. 62. 12 p.m.—Temp. 106° .

29th.—The child is lying apparently easier. No blueness of face, but natural aspect. Temp. 102.8° ; resp. 72. 2.30 p.m.—Temp. 102.4° ; resp. 62; pulse very feeble. 5 p.m.—Child died quietly.

Post mortem.—Bronchial tubes contained pus; mucous membrane over arytenoids and over pharyngeal aspect of

cricoid cartilage injected; that of interior of larynx soft and velvety, and covered with a separable false membrane below the vocal cords for some distance; above the cords there was but little evidence of disease. Trachea very small, narrowed by thickened mucous membrane; could not have admitted a pencil; contained muco-purulent fluid. Wound was three quarters of an inch long, and reached up to cricoid cartilage. No membrane in pharynx.

CASE 59.—Richard W—, æt. 16 months, Clinical, Dr. Pye-Smith, admitted June 9th, 1874.

Present illness.—On Friday last, June 5th, some cold water was spilled over him. On the following day he did not breathe as well as usual. On the 7th he had a “barking” cough. As this got worse, and there was dyspnœa, he was brought up on the 9th.

On admission, has a cough. Pulse 160; resp. 30; temp. 100·6°. A warm bath was ordered, and a mixture containing $\text{m}\times$ of antimonial wine.

June 10th.—Tonsils are red and a little swollen; no false membrane visible. There are no enlarged glands in the neck.

In the afternoon there was great dyspnœa; tracheotomy was performed. After this the breathing was easier. 9 p.m.—Temp. 101·3°; pulse 142; resp. 54.

12th.—Died.

Post mortem.—The rima and whole cavity of larynx from epiglottis downwards to two inches below the thyroid was full of a delicate, easily detached membrane; beyond this the trachea and larger bronchi were full of pus. The mucous membrane beneath was minutely injected and thickened and velvety, in a state of acute inflammation. Mediastinal glands fleshy and ecchymosed. Pharynx healthy; no lymph on it. Kidneys healthy.

CASE 60.—Eliz. H—, æt. 3, Miriam, Dr. Habershon, admitted November 8th, 1873.

Previous history.—Last night the child slept in a cold, damp room, and after a restless night the mother noticed about 5.30 this morning that her breathing was wheezing and loud, with an occasional brassy cough.

On admission, temp. $102\cdot4^{\circ}$; pulse 152; resp. 52. Has brassy cough; dyspnœa; no albumen in urine. Tracheotomy was performed at 10.30 p.m. The effect of the operation was very good; respiration became easy, the lividity of face disappeared, and the child was soon asleep.

November 14th.—Died.

Post mortem.—Epiglottis normal. Below vocal cords a thin layer of lymph extended as far as the bifurcation of the trachea; this could easily be detached. Organs healthy.

CASE 61.—Eliz. D—, æt. 1, Borough, Clinical, Dr. Wilks, January 9th, 1873.

Previous history.—Mother has another child at home who is quite well. Yesterday mother noticed that the child was restless, had catarrh, and difficulty of breathing.

On admission, has cough of a metallic character, paroxysms of dyspnœa, and running from the nose. Temp. $101\cdot1^{\circ}$; pulse 140; resp. 52. 1.40.—Tracheotomy; breathing was relieved.

10th, 11.30 a.m.—Temp. $102\cdot8^{\circ}$; pulse 200; resp. 56. In the afternoon the child coughed up a plug of membrane. There was no albumen in the urine. Died in the afternoon.

Post mortem.—Epiglottis on both sides covered with closely adherent membrane, not continuous, could not be detached without loss of substance; subjacent tissue healthy. In larynx above vocal cords there were some similar patches of membrane, none below; lining membrane of larynx was greatly swollen. Pharynx healthy. Kidneys healthy.

CASE 62.—Arthur J. B—, æt. 2, Clinical, Dr. Pavy, admitted March 5th, died March 8th, 1872. Taken ill with croup on day of admission; had great dyspnœa. Tracheotomy; afterwards rallied. Breathing became worse on the evening of 7th.

Post mortem.—Larynx lined as high as the upper edge of epiglottis with distinct membrane, scraped off without difficulty; below the wound this passed into a more purulent-looking and liquid substance; but even this had a membraniform under-surface. It extended along the whole trachea and down each bronchus as low as the second division. When removed

the membrane beneath was deeply injected. All the organs healthy.

CASE 63.—Mary P—, æt. $2\frac{1}{2}$, admitted July 24th, 1868, Dr. Habershon, Lydia.

Was in a state of extreme dyspnœa ; no inflammation of the lungs. In a dying state, if not actually dead, when tracheotomy was performed, and could not be roused again.

Post mortem.—Cervical glands healthy. The lungs were mottled over with dark purple patches ; these being airless lobules, which sank in water. The epiglottis was swollen ; the larynx much so, and having a thick fibrinous cast ; this could not be separated from the mucous membrane without bringing it away. There was an easily removable false membrane in the trachea on its hinder surface for half its length ; below this was bloody mucus in some quantity as far as the bifurcation. The tracheal false membrane was microscopically composed of close-set corpuscles, making a mass compact by reason of the closeness of the packing. When placed in a solution of nitrate of potash and left for two days in a covered test-tube it entirely disappeared. Mouth, pharynx, œsophagus, healthy. Kidneys quite healthy looking.

CASE 64.—Ellen C—, æt. 1, Dr. Fagge, Clinical, admitted June 15th, 1868. After having a cough for nine days had been attacked by croup ; and treated with emetics ; the disease not being arrested and urgent dyspnœa supervening, she was brought to the hospital and tracheotomy was performed. This gave complete relief, until nearly midnight, when a sudden attack of suffocative dyspnœa occurred, and she died.

Post mortem.—Both lungs in an extreme state of atelectasis. Air-cells were only visible in anterior half. Other parts were airless and sank in water. Lungs congested. Larynx : epiglottis thickened and swollen ; posterior surface of epiglottis was covered with thin layer of false membrane, anterior free. The glottis was almost completely obstructed by false membrane ; this membrane extended one and a quarter inch below the cricoid cartilage. The mucous membrane beneath the false membrane was much swollen. The tracheotomy tube had pushed the false membrane before it and not pierced it ;

the false membrane hanging down, and forming a valve, had probably obstructed the orifice of the tube. Mouth, pharynx, and œsophagus were healthy.

CASE 65.—Wm. John C—, æt. 5, Dr. Rees, Clinical, admitted October 7th, 1868.

Previous history.—Fourteen days before admission had a cold with slight cough; this caused no anxiety till three days previous to admission, when the peculiar character of his respiration attracted attention. Medical aid was not called till the day before admission, when he was leeched and had emetics.

On admission, had croupy respiration; dyspnœa, pulse 153. Was able to swallow. Tracheotomy was performed two hours after admission; this relieved the dyspnœa and some pieces of membrane were expectorated. Died on the 9th from asphyxia.

Post mortem.—All the tubes contained prolongation of false membrane. From below larynx through the trachea into bronchi was a tubular croupous membrane, which extended in branches through the bronchi into the smaller tubes. Mouth and pharynx healthy. Kidneys healthy.

CASE 66.—Edward H—, æt. 3, Dr. Habershon, Clinical, admitted January 9th, 1868.

Previous history.—For a week or two had slight cough and wheezing, was worse yesterday. On admission very ill; trachea was opened in the evening. Was better in the night and on the following day, but the croupy difficulty returned on the 11th. Died with convulsions.

Post mortem.—Cervical glands slightly enlarged, red, and succulent. *Lungs*: in right many lobules empty of air. Small tubes full of pus even in upper part of lungs, a slight patch of broncho-pneumonia. The large tubes were choked with muco-pus in large masses. In the upper half of trachea there was plastic membrane; this was very thick and tough around the vocal cords and reached one and a half inch above the glottis, ending in an uneven edge. The arytenoid surface, pharynx, and tonsils were quite free. Laryngo-tracheotomy had been performed. Kidneys healthy.

CASE 67.—Eliz. B—, æt. 10 months, Dr. Fagge, Miriam, admitted September 22nd, 1867. No report has been preserved.

Post mortem.—False membrane extended from larynx into bronchi; it was firm and closely adherent to mucous membrane. Would tear rather than part from the mucous membrane, which when exposed was red and raw. No membrane elsewhere.

CASE 68.—Admitted March 19th, 1865, under Mr. Poland, Charity. Tracheotomy on admission. Died March 21st.

Post mortem.—Throat healthy. Plastic lymph in larynx and trachea, very soft and easily detached, coming off in shreds; also on under surface of epiglottis. Lungs collapsed in part. Kidneys healthy.

CASE 69.—James E—, æt. 3, Dr. Barlow, Lydia, admitted July 31st, 1864. Died same day on the operating table.

Post mortem.—Mucous membrane of larynx slightly red, no false membrane. False membrane commenced just above the artificial opening, and extended to near the bifurcation.

CASE 70.—William S—, æt. $2\frac{1}{2}$, Dr. Hilton Fagge, Clinical, admitted August 13th, 1876. The child died almost as soon as admitted, and no clinical report was taken.

Post mortem.—There was a very little lymph, in a definite broad patch on each side, just below the vocal cords. None on fauces or trachea. Slight œdema of larynx. Lungs healthy.

CASE 71. John C—, æt. $2\frac{1}{2}$, Dr. Gull, Martha, admitted January 4th, 1856, died January 5th.

Post mortem.—Whole of surface of trachea from superior vocal cords to bifurcation of trachea was covered with a tenacious white membrane, which could easily be removed as a tube; mucous membrane beneath congested.

CASE 72.—John B—, æt. 4, Mr. Birkett, Martha, admitted May 5th, 1864. Tracheotomy on admission. There was a firm adherent false membrane in larynx, trachea, and bronchi.

Whole of air-passages acutely inflamed. Throat not at all affected. Lungs and spleen healthy.

CASE 73.—Sarah Ann H—, æt. 4, Dr. Gull, Lydia, admitted June 16th, 1857. Tracheotomy on admission.

Post mortem.—Throat and external surface of epiglottis healthy. Under surface of epiglottis, larynx, trachea and bronchi, covered with membranes, which adhered in shreds and were with difficulty detached. Posterior part of right lung consolidated in part. Other organs healthy.

CASE 74.—Ada M—, æt. 6, Dr. Pavy, Lydia, admitted January 19th, 1858. Five weeks before admission scarlet fever was in the house, and the child had sore throat; no eruption, nor ill enough to keep indoors. Six days ago caught cold, had cough and dyspnœa.

On admission had all symptoms of croup.

On 20th tracheotomy; died suddenly on 23rd.

Post mortem.—Inflammation of whole of air-passages. Under surface of epiglottis, together with larynx, trachea, and bronchi, entirely covered with a firm fibrinous exudation. Membrane was lost in purulent mucus; the membrane was with difficulty detached from epiglottis, but could be removed as a tube lower down. Right upper lobe of lung hepatized. A few tubercles were found; some of the bronchial glands were strumous. All other organs healthy.

NOTE.—This child's sister, æt. 8, was admitted with croup, December 12th, 1857. Tracheotomy was performed, and she was sent out well on December 17th.

CASE 75.—John William W—, æt. 6, Bethnal Green, admitted March 7th, 1871, under Dr. Wilks into Clinical ward.

Previous history.—Is one of eight children, none of whom have suffered from any throat affection. Yesterday complained of feeling poorly, so was kept from school. Child was sick, and breathing became noisy.

On admission had cough, dyspnœa, expectorated flaky membranes. Pulse 140. Urine not albuminous.

8th.—Tracheotomy was performed, and breathing became easier.

10th.—No albumen in urine.

11th.—Child died.

Post mortem.—Tracheal wound just below cricoid and through three rings. False membrane in larynx, trachea, and bronchi. Mucous membrane reddened.

CASE 76.—Harriet D—, æt. $1\frac{3}{4}$, admitted December 10th, 1869, under Dr. Rees into Lydia, died December 15th. Cough, &c., for a month.

Post mortem.—Acute plastic laryngitis; membrane adherent to vocal cords; membrane brittle, hard, and detached with difficulty; none in the trachea.

CLASS III. CASES OF LARYNGITIS HAVING A CLINICAL RESEMBLANCE TO THOSE OF CROUP, BUT IN WHICH NO FALSE MEMBRANE WAS PROVED TO EXIST.

CASE 77.—Richard P—, æt. $2\frac{1}{2}$, admitted January 28th, 1868, under Dr. Habershon into Miriam ward.

Past history.—Had a cold last week.

The present attack came on at twenty minutes before 2 o'clock this morning. The child suddenly started up in bed and struggled for breath. It was brought to the hospital at 7 p.m., and tracheotomy was immediately performed, the child being nearly asphyxiated; it soon came round. The mother does not know of any diphtheria or other throat affection being in the neighbourhood.

29th.—The child is sleeping. Resp. 48; pulse 120.

30th.—Child died with severe convulsions.

No post-mortem examination seems to have been made.

CASE 78. Alfred E—, æt. 11 months, admitted October 6th, 1869, under Dr. Owen Rees into Miriam ward.

Previous history.—Three weeks ago patient had scarlet fever. Had recovered from it, and seemed quite well by Monday, September 27th. On the 29th the child had a slight cough and difficulty of breathing.

On admission, much distressed. Breathing very rapidly, loud crowing sound accompanying each expiration. Temp.

102°; pulse 180; resp. 52. At noon tracheotomy was performed. During the operation the child vomited freely and appeared much relieved.

7th.—Died. No post-mortem examination seems to have been made.

CASE 79.—John C—, æt. 4½, admitted March 9th, 1867, under Dr. Wilks into Clinical ward.

The child had had a cold for some days. On the 7th it was worse, and kept at home. It was admitted with symptoms of laryngeal obstruction. No membrane was seen. Urine not mentioned. Tracheotomy was performed. The child recovered, and was discharged on April 20th.

CASE 80.—Chas. S—, æt. 6, admitted July 12th, 1867, under Dr. Moxon into Miriam ward.

Past history.—Has had cold for some days past. Breathing became difficult on the 12th.

On admission, fauces are red; no false membrane to be seen. Pulse 152.

13th.—Tracheotomy was performed.

16th.—No albumen in urine.

August 7th.—Went out well.

CASE 81.—Matthew C—, æt. 6, admitted March 17th, 1867, under Dr. Wilks into Miriam.

Previous history.—On March 11th complained of slight sore throat. Has just got over an attack of measles. Since then his breathing has got worse.

On admission, suffers from great dyspnœa, and makes a hoarse noise in larynx. There is no false membrane to be seen. Improved daily. Went out on April 7th.

CASE 82.—Daniel C—, æt. 18 months, admitted February 23rd, 1869, under Dr. Owen Rees into Lydia.

Was taken out by parents somewhat relieved.

CASE 83.—Daniel S—, æt. 2, admitted April 16th, 1874, under Dr. Taylor into Clinical ward.

Has had cough since April 4th. No history of infection, or of others in the family having the disease. Respiration difficult.

Temp. 99.2° ; pulse 120; resp. 44. Gradually improved, and went out on May 1st.

CASE 84.—Charles J—, æt. 7 months, admitted March 24th, 1874, under Dr. Moxon into Clinical. Always had cough. Four days previous to admission had croupy cough and dyspnœa; had emetics and poultices.

On admission, croupy cough, great dyspnœa. Child is drowsy. Nasal catarrh. Temp. 100° ; pulse 136; resp. 47. Child gradually improved, and went out well on April 14th.

CASE 85.—Laura S—, æt. 7, admitted October 23rd, 1874, under Dr. Habershon into Miriam ward. Nineteen days ago she first lost her voice and began to have difficulty in breathing and nasal catarrh. She improved for a time, but became worse three days before her admission. She was then suffering from well-marked symptoms of croup. The temperature was 101° . There was no enlargement of the tonsils, and the fauces appeared normal. About 2 p.m. death from suffocation appeared imminent, and tracheotomy was therefore performed. At 9 p.m. the urine (which seems not to have been tested before) was found to contain albumen. She went on perfectly well. The tracheal tube became from time to time clogged with mucus, but no membranes were at any time observed. The quantity of albumen found in the urine was much less on the 24th than on the previous day, and on the 25th the renal secretion was normal.

She was discharged well on November 24th.¹

CASE 86.—J. M—, æt. 2 years and 2 months, admitted, January 3rd, 1874, under Dr. Pavy, Clinical.

Previous history.—On Christmas Day was taken very ill with wheezing and drowsiness. On the following day she was much worse, and the medical man (Dr. Bonny) said she had diphtheria. Expectoration was mixed with blood.

On admission, child was suffering from dyspnœa, no membrane was found in throat and larynx on examination with the laryngoscope. Urine was free from albumen. Pulse 144. Dyspnœa was so urgent that tracheotomy had to be resorted

¹ This case has already been recorded by Mr. Howse ('Guy's Hosp. Rep.,' xx, p. 510).

to. Just before the operation, temp. 97.8° ; pulse 168; resp. 36. In the evening, temp. 101° ; pulse 160; resp. 52.

January 4th.—Patient is breathing comfortably. Temp. 102.7° ; pulse 184; resp. 52. Patient was in the hospital till February 27th, and was readmitted February 28th, owing to râles being heard in chest.

Went out well March 27th.

CASE 87.—William P—, æt. 6, admitted August 26th, 1876, under Dr. Fagge into Clinical. Has been ailing for the last week; two days before admission had croupy voice.

On admission, has croupy voice and slight dyspnœa. No membrane can be seen. Right lung dull at apex. Temp. 100° ; resp. 40.

27th, 10 a.m.—As there was great dyspnœa tracheotomy was performed, which was followed by marked relief. 12.30. —Resp. 32; pulse 132. Child is not making any noise in its breathing. Continued to improve daily; tube was removed on September 5th.

Discharged September 25th.

CASE 88.—Isabella C—, æt. 15 months, Woolwich, admitted February 21st, 1876, under Dr. Moxon, into Clinical.

Past history.—The child and two others have just recovered from measles. Had a cough through the course of measles.

On admission, has paroxysms of ringing cough. Fauces and soft palate are a little injected; no deposit. Temp. 98° ; pulse 150; resp. 38.

22nd.—Temp. 99.1° ; pulse 130; resp. 40. Evening, temp. 97.4° ; pulse 140; resp. 40. The brassy cough gradually diminished in the frequency of its paroxysms.

March 1st.—Went out.

CLASS IV. CASES OF MEMBRANOUS LARYNGITIS, WITH OR WITHOUT PHARYNGITIS, DIRECTLY CAUSED BY LOCAL INJURY TO THE THROAT OR SECONDARY TO PRE-EXISTING LOCAL DISEASE.

These may be naturally subdivided into—

1. *Cases due to injury.*
2. *Cases secondary to disease.*

Section 1. Cases of membranous pharyngitis or laryngitis due to local injury of the throat.

CASE 89. *Scalded throat*.—John K—, æt. 2, admitted March 31st, 1875, into Charity, under Mr. Cooper Foster.

About 8 p.m. on March 30th child drank some boiling water, and an hour afterwards the tongue, palate, and throat, were very much swollen, and the child could not speak. About 11 p.m. suffered from dyspnœa; this got worse by the next morning, when he was admitted.

On admission tracheotomy was performed; breathing was relieved. Pulse 160; resp. 60.

April 3rd.—Spat up some large pieces of membrane and was relieved.

5th.—Tube removed. Wound widely gaping, covered with slough; parts around much inflamed. Pulse 140; temp. $100\cdot8^{\circ}$.

7th.—Pulse 128; temp. $105\cdot2^{\circ}$. Great dyspnœa. Died after a slight convulsion.

Post mortem.—Larynx was healthy down to wound, which formed a very irregular wide opening of ash-grey colour. Below it the trachea for one inch was lined by a thin membrane, not very separable. Where the tube had pressed, one of the tracheal cartilages had ulcerated through.

NOTE.—The child's mother said that before the accident it had a croupy cough, but one did not know how much value to attach to this statement.

CASE 90.—Bernard F—, æt. 12 months, admitted October 13th, 1873, under Dr. Habershon into Clinical.

Past history.—A week ago the baby's brother, a child $2\frac{1}{2}$ years old, put a burning stick in his mouth; this caused a blister at the side of the tongue.

On the 9th and 10th it had epistaxis, on the 12th convulsions. When admitted the baby looked pale and thin; its pupils were dilated. Temp. $106\cdot6^{\circ}$. Pharynx, tonsils, and back of tongue ulcerated and red in parts, at others covered with a white membrane. 4 p.m.—Temp. $105\cdot2^{\circ}$; resp. 60. 9 p.m.—Temp. 104° ; resp. 60.

14th.—Breathing hurried, difficult, and wheezing. Throat covered with membrane. Temp. 106° . It died the same day.

Post mortem.—Larynx healthy. The soft palate had two ulcerated openings extending quite through it, the largest would have admitted a crow-quill. The buccal surface of soft palate looked discoloured, and had on it a small quantity of adherent lymph. The openings in soft palate were evidently traumatic. Kidneys healthy.

CASE 91. John H—, æt. 3, admitted August 22nd, 1872, under Dr. Pye-Smith, Petersham.

Previous history.—Child had been quite well until the 20th, when he swallowed a piece of hot potato, which lodged in his throat for some time; he afterwards complained of sore throat and of pain at the epigastrium; he was sick and had great difficulty in breathing during the night. There is no diphtheria in the neighbourhood.

On the 21st he was brought to the hospital, but was not admitted.

On 22nd he was taken into the ward.

On admission, breathing is difficult, face flushed. The uvula is much swollen and with the fauces is covered with a white membrane, which cannot be removed. Temp. 102.2° . In the evening tracheotomy was performed.

23rd.—The child is much easier this morning.

24th.—Died of asthenia.

Post mortem.—Tonsils and root of tongue presented flakes of lymph; some was separable, leaving a red mucous membrane; entrance of larynx swollen. Interior was lined with lymph, forming a more or less perfect tube, pushed aside where tracheotomy wound was. Whole trachea was more or less lined with lymph, and intensely injected.

CASE 92. *Scald of throat; tracheotomy; death.*—Mary A—, admitted February 18th, 1868, under Mr. Birkett, into Martha.

February 17th.—Drank hot water from a bottle.

On admission child was in a comatose state; tracheotomy was immediately performed. Pulse 190; resp. 64.

20th.—Pulse 170; temp. 101.1° ; resp. 38.

21st.—Pulse 168 ; temp. 101° ; resp. 48.

Died on the 22nd.

Post mortem.—Epiglottis and epiglottidean folds œdematous, covered by a thick whitish layer of false membrane, which extended to posterior wall of pharynx. Tracheotomy wound in median line, through upper rings of trachea, below cricoid cartilage. Slough of anterior part of membrane of trachea, where the tube pressed. Kidneys healthy.

CASE 93. *Scald of throat ; tracheotomy ; death.*—Jane H—, æt. $2\frac{1}{4}$, admitted February 12th, 1874, under Mr. Durham, into Dorcas. The child was admitted suffering from a scalded throat. It had a cough previously, said to be whooping-cough.

February 15th.—Cough was first noticed in the hospital to-day. This got rapidly worse, and breathing was impeded.

18th.—Cough was much worse, and noticed to be of a croupy character.

19th.—Breathing became urgent. Tracheotomy was performed.

21st.—Temp. $100\cdot8^{\circ}$; pulse 160. Anterior part of tongue has superficial ulcers on it. Membrane has been seen at the back of the fauces to-day, none anteriorly. The wound looks a little sloughy.

23rd.—Died.

On post-mortem examination membrane was found on the pharynx and larynx, and down as far as the minute branches of the bronchial tubes.

CASE 94. *Cut throat ; plastic tracheitis and bronchitis.*—Thomas C—, æt. 24, admitted June 9th, 1873, with throat cut, under Mr. Durham, into Accident. Temp. $99\cdot8^{\circ}$; pulse 100.

24th.—Temp. $101\cdot3^{\circ}$.

28th.—Died suddenly at 8 p.m.

Post mortem.—Wound of larynx above upper border of cricoid cartilage. Above this the surface of larynx was healthy ; below, it was almost universally covered with an ashy-grey membranous layer, which could with difficulty be got off. Plastic membrane extended down the bronchi to minute tubes on one

side. Lower part of right lung was hepatised. Pharynx healthy. Kidneys healthy.

CASE 95. *Inflammation of air-passages from scald.*—Caroline N—, æt. 3, admitted May 17th, 1867, under Mr. Cock into Dorcas, died May 30th. Drank scalding water from a teapot; tracheotomy.

Post mortem.—Plastic lymph in pharynx and larynx, traceable into smallest bronchial tubes; in pharynx it was adherent to mucous membrane.

CASE 96. *Inflammation of glottis from boiling water; tracheotomy.*—Wm. C—, æt. 5, admitted January 20th, 1862, under Mr. Birkett into Martha, died 21st. Drank out of a kettle of boiling water on 19th.

Post mortem.—Uvula and soft palate swollen and thickened. Œsophagus unaffected. Glottis and epiglottis swollen; covered with a layer of lymph; a little lymph within glottis. Lungs congested in parts.

CASE 97. *Scalded throat; tracheotomy; broncho-pneumonia.*—Caroline D—, æt. 2½, admitted April 12th, 1860, under Mr. Birkett into Esther, died 16th. Four hours before admission drank boiling water from a kettle. When child was brought in breathing had ceased; tracheotomy was performed, and child brought round. Appeared to go on well for two days.

Post mortem.—Glottis swollen, not closed; lymph firmly adherent in patches to the edge, also to epiglottis and parts external. In some places a slight breach of surface or minute ulceration. The under surface of epiglottis was covered with a delicate layer of lymph, and this continued into the bronchial tubes; it formed a distinct membrane, and was easily separated; below, it was lost in muco-purulent fluid. Lungs partly consolidated; bronchial glands enlarged and soft.

CASE 98. *Bean in the bronchus; tracheotomy.*—Geo. K—, æt. 3, admitted May 6th, 1859, under Mr. Forster into Charity. On 5th child had a bean in its mouth, which entered trachea. No urgent symptom till following morning, when he was brought with severe dyspnœa and lividity; no air entered right lung. Tracheotomy was performed and child shaken. Died three days after accident.

Post mortem.—Right lung collapsed, air-passages acutely inflamed, glottis swollen, and larynx and trachea covered with a membranous lymph, as in croup, but to less extent, and below this mucus. Bean swollen and impacted in right bronchus.

CASE 99.—*Scalded throat; tracheotomy.*—John C—, æt. $1\frac{1}{2}$, admitted May 2nd, 1858, under Mr. Bryant into Esther. Drank boiling water from a kettle on May 1st. Difficulty of breathing came on the following morning Tracheotomy performed. Died May 6th.

Post mortem.—Tongue was slightly excoriated; glottis and epiglottis swollen from exudation; opening in trachea was below cricoid cartilage; whole of air-tubes inflamed and filled with secretion; that of trachea could be taken off in films.

Section 2. Cases of membranous pharyngitis or laryngitis secondary to pre-existing disease of the air-passages or of the lungs.

CASE 100.—*Membranous laryngitis secondary to tubercular ulceration of larynx.*—Arthur N—, æt. 30, admitted under Dr. Wilks into Stephen ward, March 11th, 1874; he died on April 5th.

On post-mortem examination, which was made by Dr. Goodhart, the larynx was found ulcerated at the back of the vocal cords. The epiglottis was covered with yellow lymph on its laryngeal surface. The trachea and bronchi were healthy; the lungs were affected with acute tubercular phthisis.

CASE 101.—*Membranous laryngitis secondary to cancer of the pharynx.*—Charlotte W—, æt. 32, admitted into Esther ward, under Mr. Cock, February 7th, 1856, died March 6th. She had some difficulty of swallowing for a few days before death.

Post mortem.—The larynx and trachea were acutely inflamed, being lined with a complete layer of lymph as in croup; this was thin and closely adherent; it ceased at the bifurcation.

CASE 102.—*Membranous laryngitis apparently secondary to tracheotomy for syphilitic disease of the larynx.*—Charles H—, æt. 32, admitted into Lazarus ward, under Mr. Birkett, on September 17th, 1856; he had frequent attacks of difficulty of breathing, and on the 29th tracheotomy was performed. He seemed relieved, but bronchitis came on and he died on October 4th.

Dr. Wilks made a post-mortem examination, when, besides chronic syphilitic disease of the larynx and right bronchus, the whole of the air-passages below the tracheotomy wound were found to be acutely inflamed. They were covered with mucus, and when this was washed away a coating of lymph was seen, adherent to the mucous membrane. The inflammation seems to have been most intense round the opening in the trachea, where the mucous membrane showed numerous minute points of pus.

CASE 103. *Membranous laryngitis, associated with acute pneumonia.*—Isaac J—, æt. 42, admitted into Philip ward, under Dr. Rees, on May 17th, 1860, and died the next day.

Dr. Wilks made a post-mortem examination and found that the right lung was almost universally in a state of purulent infiltration; the tubes in it were filled with lymph. The larynx was deeply injected and lined with secretion, and showed small patches of lymph here and there. The pharynx also was of a dark colour, from extensive congestion. At the upper part of the œsophagus also there was a white patch, but this had probably been caused by a piece of caustic, which had fallen off while the man's throat was being touched with nitrate of silver.

CASE 104. *Acute membranous inflammation of the air-passages, consecutive to chronic pneumonia.*—Eliza J—, æt. 32, admitted into Miriam ward, under Dr. Fagge, on April 4th, 1867.

She said that on March 25th she went into a shop to purchase something, but found that she could not speak. Next day she was ill, and on the day after that she took to her bed. She never recovered her voice.

On admission, her temperature was 101°. She had dys-

pnœa, loss of voice, and pain in swallowing and when pressure was made on the larynx. Tracheotomy was performed at 6 a.m. She was much relieved by the operation, but afterwards gradually sank and died at 6 a.m. on the 6th.

Post-mortem examination by Dr. Moxon.—There was recent pleurisy. The lower lobe of the right lung was consolidated and shrunken by interstitial pneumonia of old date. The tubes there were completely filled to their minutest ramifications by nearly solid plugs of fibrin, with only very small channels in their centres. From these tubes up through the right bronchus to the entrance of the larynx there was a continuous false membrane, which was tubular in the upper part of the air-passages and about one sixteenth of an inch in thickness. Just below the arytenoid aperture it became very thick, and at the rima glottidis there was no passage at all. The membranous cast tore vertically to the surface; it was made up of fibrils like those of blood-fibrin; there were few corpuscles in it.

The pharynx was healthy.

Imperfect as these records are, they at least enable us to form some judgment as to the extent to which the doctrine that all membranous croup is diphtheria would, if adopted by the physicians of the hospital, modify their interpretation of the cases coming under their observation.

And, in the first place, I think that the cases in Class IV negative the *à priori* argument that the mucous membrane of the air-passages is not likely under simple (or non-specific) irritation to take on an inflammatory process attended with the formation of false membranes. There are recorded sixteen instances in which a membranous laryngitis was developed as the result of scalds by hot water, after the entrance of a foreign body into the trachea, after a cut throat, after tracheotomy for various conditions, or secondarily to some disease of the air-passages. Some of the cases in question might, indeed, be plausibly attributed to infection from tracheotomy instruments, if we were to suppose those instruments to have been previously employed for cases of diphtheria, and to have been insufficiently cleaned. Mr. Howse has told me

that he believes this to have occurred in Case 89, which came under his observation at the time. But this explanation goes only a very little way.

Secondly, the cases in Class IV show that, great as is the anatomical difference in structure between the pharyngeal mucous membrane and that which lines the larynx, it is no barrier to the transference of morbid action from the former to the latter surface. The same thing is notoriously true as regards diphtheria. But if a plastic laryngitis may be set up by extension downwards from the pharynx, one does not see why a membranous pharyngitis may not be consecutive to a similar affection of the air-passages; in other words, there is no reason for supposing that a simple membranous croup (if such an affection exists) may not be attended with the formation of false membrane upon the fauces.

Thirdly, the cases of laryngitis recorded in Class III, in which no false membranes were proved to have been formed, do not appear to have differed notably in their clinical features from those in Class II, in which false membranes were discovered after death, or expectorated during life. So far as the imperfection of these Reports enables us to judge, there is only one case (Case 77) which presented any of the characteristics of "stridulous laryngitis" in "spurious croup." It seems to me that this affection, as it is described by French writers, has a fair claim to be considered a separate member of the nosology, its distinguishing features being its liability to return again and again in the same patient, and the suddenness of its commencement, with symptoms which from the very first are of the most alarming character, but which quickly subside and never lead on to a persistent attack, lasting for several days without intermission. Unless, however, we insist upon these characteristics, I can perceive no valid reason for drawing a boundary line between those cases of croup in which membranes are, and those in which they are not, found to exist. In many of the former cases they are not discovered until a post-mortem examination is made. Now, the latter cases are seldom, if ever, fatal: I cannot find in our records a single case of croup in which the patient died and no false membranes were found.¹ If, on other grounds, mem-

¹ Since this was in type I have made a post-mortem examination in a case of

branous croup can be shown to be always a laryngeal diphtheria, the distinction between the two sets of cases is of course necessary. But unless this can be done, to suppose that such a distinction exists is almost the same thing as to assume that a disease, when it is fatal, is attended with morbid changes essentially different from those which characterise it when recovery takes place. And I submit that this is altogether without precedent in pathology. Considering that in every instance in which false membranes are found in the air-passages, they shade off into muco-purulent matter in the trachea or bronchi,—and that, in some instances, there are only small shreds of lymph imbedded in such secretion within the larynx itself,—it is surely very improbable that the presence or absence of false membranes forms an absolute distinction between two entirely different diseases. My own opinion is that the cases in Class II and those in Class III should be associated together under the common name of croup, assuming always that it is not proved that those in Class II belong to diphtheria.

Fourthly, we now come to the question as to the relation between the cases in Class II and those in Class I; and at first sight there seems to be a very marked contrast between them. In Class I we have a highly infectious disease, of which albuminuria is a very frequent symptom, and which is often attended with swelling of the cervical glands. In Class II we have a disease which seems not in a single instance to have arisen in contagion, nor to have spread to other patients: in only one of the nineteen cases in this class was albuminuria noticed to have been present; and I think there is only one in which the glands are said to have been swollen.

But I am bound to say that a closer analysis of the cases in Class I throws some doubt upon the validity of the distinctions to which I have just referred; and I must acknowledge my indebtedness to Dr. Greenfield—one of my colleagues on the Croup and Diphtheria Committee, and the Secretary to the Committee—for having suggested to me in

croup, in which death occurred after fifty-one hours' illness, and in which the larynx was perfectly healthy, but the trachea and bronchi contained a soft viscid muco-purulent material, without even any shreds of false membrane in it.

conversation certain objections which might fairly be made to them.

The first point is the preponderance of children among those cases in Class I, in which diphtheria spread to the air-passages. Among the cases contained in Section 2 of Class I there are twenty patients who came into the hospital suffering from diphtheria; five who caught it while in the wards. The latter were adults; but of the former twelve were under the age of five years, four between the ages of five and fifteen, and four above fifteen years old. And all but one of the cases in Section 3 were those of children under five years. Again, there has not been a single case in which a child below that age has died of diphtheria in the hospital, and has been found to have its larynx free on post-mortem examination. This excessive liability of children to be affected with the laryngeal form of diphtheria, at the very age which has been generally supposed to be that at which croup is most apt to occur, may certainly be made a point in favour of the identity of the two diseases.

Again, we find a difference in the extent to which the cases in Sections 1 and 2 respectively can be brought into connection with other cases of diphtheria, either as having caught the disease from them or given it to them. Among the fifteen indisputable cases of diphtheria in the former section there are eleven in which such a connection can be traced. But of the twenty-five cases in the latter section there are only eight in which the existence of a contagious or epidemic influence is recorded. One therefore is not surprised to find that not one of the cases in Section 3 afforded an instance of the manifestation of such an influence. It undoubtedly seems as though diphtheria were less contagious in proportion as the fauces are less severely affected. The comparatively rapid course and early fatal termination of the cases in which the disease extends to the air-passages suggests itself as an explanation, but I doubt whether it is a satisfactory one. The only way of interpreting the cases in Class I by which one could avoid this conclusion would be by supposing that a non-specific membranous croup may be attended with the formation of extensive patches of false membrane on the fauces; in other words, that a large number

of the cases in Section 2, and almost all those in Section 3, are not instances of diphtheria at all. This is a question to which I shall presently return.

But, if it be true that laryngeal diphtheria is comparatively little contagious, one can hardly attach much importance to the fact, which at first sight appeared so striking, that no contagion can be traced in any of the cases of membranous laryngitis in Class II, which I have classified as of doubtful origin.

Another point on which I was at first inclined to lay great stress is that no instance of membranous laryngitis, apart from pharyngeal diphtheria, has occurred among those cases in which the disease has arisen by contagion in persons already in the hospital. But it may be argued that if laryngeal diphtheria is peculiar to children, one would hardly expect to find it developing itself in the wards of a hospital like Guy's, in which the great majority of the patients are adults. Still there are some children in almost every division; and I think that some importance may fairly be attached to the fact just stated. The experience of a hospital specially devoted to children's diseases would be of great value.

Other points of distinction failing us, we can fall back upon the general numerical ratio between the cases of recognised diphtheria and those of membranous laryngitis admitted into the hospital, and we may ask whether there are not too many of the latter to be set down as instances of an exceptional variety of the former disease. Now, so far as I know, the only trustworthy statements as to the frequency with which diphtheria when epidemic attacks the larynx without at the same time affecting the pharynx or tonsils are those of Bretonneau and Guersant.¹ Guersant ('Syd. Soc. Memoirs,' p. 216) says that the number of such cases may perhaps amount to a twentieth of all cases of diphtheria, but he implies that unless the fauces are inspected from the very

¹ Since this was written I have read Dr. Yeats' account of an epidemic which occurred at Auchtergaven in Perthshire ('Ed. Med. Journ.,' 1876). Among 183 cases there were 15 in which laryngeal symptoms were present from the commencement, but in which there was no visible affection of the fauces, when they were first brought under notice; and in 6 of these the pharynx remained free during the whole progress of the disease,

commencement of the disease the presence of slight membranes upon them is apt to be overlooked. Bretonneau relates only one case of what he believed to be purely laryngeal diphtheria among the forty-five recorded in his papers on the subject; and in that instance (p. 165 of Syd. Soc. translation) there is really no proof that the disease was diphtheria rather than simple croup. He goes on to say that it was the second time, and in the proportion of one to thirty, that he had met, after death, with diphtheritic inflammation limited to the air-passages.

At Guy's Hospital we seem to have had nineteen cases of membranous laryngitis to fifty-seven of diphtheria. It is true that the reports of many of the former cases are imperfect; but I do not think it is likely that the clinical clerks have often failed to note down the presence of false membranes upon the fauces, where any have been detected; and as their absence has for years past been regarded as the crucial distinction between the two diseases, they are certain to have been looked for. But whatever deduction should be made, on the score of incompleteness, from the cases of membranous laryngitis, a large deduction must also be made from those of diphtheria before a fair comparison can be instituted. For in ten of the latter cases this disease arose by contagion in persons already in this hospital; and Class I includes several other cases of which the real nature is altogether doubtful. Now, I do not see any reason why diphtheria should attack the larynx more often when it is sporadic than when it is epidemic. I, therefore, must regard the relatively large number of cases of membranous laryngitis as a weighty argument in favour of the separate existence of a membranous croup.

Hitherto I have argued the question on the basis that the presence of patches of false membranes on the fauces proves a case to be one of diphtheria. But, after all, this is an assumption, and one which, as I have already shown, is rendered improbable by the fact that in the cases in Class IV the pharynx and the larynx have frequently been found to be simultaneously affected. Between the years 1839 and 1849, long before epidemic diphtheria was prevalent in London, Dr. West found that the velum and tonsils presented false membranes in a

considerable proportion of his cases of croup. I am not at all sure that the real solution of the difficulty may not be found in abstracting from diphtheria a considerable number of the cases in Section 3, and even some of those in Section 2, of Class I. We should then get rid of the puzzling anomaly that the disease seems to be so much less contagious when it mainly affects the larynx than in the ordinary pharyngeal variety.

It is possible that a further head of evidence in regard to the question of the relation of membranous laryngitis to diphtheria may be found in the proportionate number of males and females especially attacked by these diseases. All writers say that croup is more common in boys than in girls. This is confirmed by the cases in Class III, as regards the affection in which no false membranes are developed. But diphtheria is equally prevalent in the two sexes. If, therefore, males should preponderate among those who suffer from membranous laryngitis, one would be disposed to associate it with croup; if not, one would rather take it for a form of diphtheria. Now, in Class II there is no excess of boys; but it is curious that they do preponderate among the cases in Section 3 of Class I.

Let me recapitulate, in somewhat different language, the main conclusions to which the facts recorded in this paper appear to lead us:—We find that the attempt to separate from diphtheria a membranous croup in which the fauces remain entirely free from false membranes is beset with difficulties. The cases (which must then be called cases of diphtheria) in which the air-passages are attacked, the palate and tonsils being but slightly affected, occur almost exclusively in children; and they are seldom, if ever, infectious, whereas pharyngeal diphtheria is highly infectious. But when one has once admitted that the different forms of diphtheria present different degrees of infectiousness, and that each of them occurs with special frequency at a particular period of life, one is debarred from insisting on the sporadic character of membranous laryngitis, and the fact that it never arises in the wards of a general hospital, as proof that it is distinct. It is otherwise if we draw the boundary line, not between the cases in Class I and those in Class II, but within Section 2 of

Class I itself; allowing that the non-specific, simply inflammatory, affection may be attended with the formation of false membranes even on the fauces. Such a view does away with the very improbable supposition that laryngeal diphtheria differs from the ordinary form of the disease in being peculiar to children, and in possessing little or no infectiousness; and I think that it commends itself to us on other grounds also.

ON THE USE AND ADMINISTRATION OF SEDATIVES.

BY PAUL HENRY STOKOE, B.A., M.D.

II.

IN a former article I directed attention to the beneficial effects of sedatives in the treatment of several of the more grave inflammatory diseases, and incidentally alluded to their employment in parturition and in many of the disorders of childhood, especially those of a convulsive nature; it remains for me to speak of the use and administration of sedatives in some of the less severe maladies—maladies which, whether engendered by our own errors or by the errors of our progenitors, whether engrafted upon us by noxious influences from without or by gnawing cares within, entail in the aggregate an enormous amount of suffering.

But before entering upon this division of my subject it will be not inappropriate to offer a few suggestions on the employment of sedatives in diseases of the heart; and this more especially because, in some quarters, there appears undue hesitancy in vigorously attacking the enemy with these powerful weapons when he is intrenched within the citadel of life.

In the treatment both of acute and chronic diseases of the heart and of their disastrous sequelæ no remedies will be found more adequate to avert a fatal termination, assist recovery, or prolong life, than sedatives; but in having

recourse to their aid it is more than ever incumbent upon us to inform ourselves of their specific action, and of the precise condition of the organ requiring their medication. Apart from that diagnostic and therapeutic skill which is only to be acquired by long and laborious observation at the bedside, there is a certain theoretical knowledge of the condition of the heart under disease and of the special attributes of cardiac remedies which is capable of being communicated to others, and may safely be adopted as principles for our guidance; and in the case of the most efficacious cardiac remedies digitalis, belladonna, opium, and aconite, these principles may be reduced to almost axiomatic precision. Speaking generally, diseases of the heart may be said to be characterised by alterations in the frequency and regularity of the normal, and by the production of abnormal sounds; these physical signs being based upon various morbid changes and accompanied by more or less severe symptomatic disturbance. The pathological import of these two classes of symptoms, the local and the constitutional, must be estimated according to the particular stage at which they occur and the acuteness of the attack, the pyrexia at the onset of an acute inflammation of the heart being of the first importance by reason of its sinister influence on the nervous centres, while in the later stages it is the secondary structural changes which are most significant. Nevertheless, in not a few instances, the mechanical derangement of the organ is from the first so serious as to call for our most energetic interposition.

The pyrexia attendant upon acute cardiac disease is distinguished by the usual symptoms, but is wont to present more than the usual intensity, from the fact that there is super-added to that excitation of the heart which is pathognomonic of pyrexia a diseased state of the organ itself, under which it is called upon to perform exceptional duties at a time when it is too much crippled to efficiently perform its ordinary function. How great this demand sometimes is may be imagined from the fact that in rheumatic pericarditis and endocarditis the almost unprecedented temperature of 115° has been registered, and that in these affections a temperature of 110° is by no means uncommon. In the rapid disintegration of tissue which this hyperpyrexia implies no measures will avail

to save life which do not speedily reduce the temperature; and the experience of Dr. Wilson Fox and other observers forces upon us the conviction that nothing but ice-cold baths or packing will effect this. But even in inflammations of the heart of less exceptional severity the pyrexia is for the most part sufficiently intense, and all the careful discrimination we may exercise in the selection of the most appropriate medicines to control it will amply repay the care expended, notwithstanding the incredulity of those who advocate the expectant method of treatment in this and analogous disorders.

When the muscular tissues are seriously implicated in an inflammatory attack on the heart, feebleness and irregularity or intermission in its action may be expected, and when present indicate a state of peril; and no less so when these several signs of failing power accompany a large accumulation of fluid in the pericardial cavity. They also sound a warning-note of danger (however we may interpret them) when they exist along with endocardial murmurs; but post-mortem examination shows that, in the absence of extensive hydro-pericardium or of considerable disorganisation of the muscular substance, valvular murmurs alone rarely involve present danger but are prognostic of a maimed existence in the future.

In addition to the adverse indications afforded by high temperature, and by feebleness, intermission, or irregularity in the action of the heart, we often meet with manifestations of serious disturbance to the function of the lungs; and in the most critical cases a further element of danger may be caused by the participation of the nervous centres in the disease. In these various complications we possess landmarks for guidance in our prognosis and treatment. In the milder forms of endocarditis and pericarditis we are especially concerned for the ultimate integrity of the organ; in those attacks in which the substance of the heart participates to any considerable extent in the inflammatory process we have immediate peril superadded to our anxieties for the future; and in those most severe cases in which the cerebro-spinal or sympathetic systems are seriously implicated, the necessity for timely and energetic measures is imposed upon us if life is to be saved. But what is of especial importance in these

acute diseases is that, with rare exceptions, it is the intensity of the pyrexia that imparts its peculiar peril to the attack, and it is to its resolution that our efforts must be directed; and we may expect to meet with success commensurate with the degree of accuracy with which we recognise the simple motive of an illness which may present a very complex aspect, and modify our treatment to meet the apparently antagonistic indications which often present themselves.

The occasional occurrence of two very unfortunate complications in endocarditis, ulceration and embolism, does not in the least detract from the importance assigned to a high degree of fever, for it may be considered established that the violent movements of the heart which are due to the pyrexia lead to the production of ulcers of the endocardium, and to the dislodgment of vegetations from the valves.

Aconite is no less efficacious in moderating inflammations of the heart than those affecting other organs, and if its operation should appear less marked and trustworthy it must not be overlooked that its apparent shortcomings have their explanation in the extraordinary difficulty of the task to be accomplished; for we are here called upon to lighten the labours of a vital machine, which readily falls into a paralysed condition from nervous exhaustion or prolonged interference with its mechanism; to give rest to an organ which, in the very nature of things, is incapable of a moment's cessation from movement; and which, when affected by disease, is only too prone to take that rest which is the rest of death. This proneness of the heart to "run down" is especially seen in the earlier stages of acute attacks, before it has adapted itself to the struggle for existence under adverse circumstances, or had time to provide those compensatory developments which are met with in old-standing disease.

The effects of aconite (which should always be given in small and often-repeated doses, and with finger on pulse, so to say) are soon apparent in a marked decline in the rapidity and violence of the heart's action, but this salutary result is brought about at the expense of the muscular tonicity of the organ; and when this tonicity is already greatly impaired by the ravages of the disease there is risk of the supervention of

a fatal reduction of power. A like result might ensue from its administration in an unmodified form, when the heart is with difficulty contending with the impediments to the circulation caused by regurgitant or obstructed blood-flow, or by the pressure of a distended pericardium; but in digitalis, belladonna, and opium we have agents capable of regulating and invigorating the contractility of the heart; and by their various combinations with aconite we shall seldom fail to utilise the potent but too depressing effects of the latter. This increase in muscular tonicity is especially promoted by digitalis when given in moderate doses in the form of the recent infusion; but inasmuch as it often greatly augments the irritability of the heart at the same time as it strengthens its contractions, it is less admissible than some other sedatives when the movements of the heart are both rapid and violent, as is usually the case at the commencement of most of the acute inflammations. Under these circumstances opium responds better to the indications, and calms the excitement without causing undue stimulation. This effect of opium appears to be owing in a great measure to its paralysing action on the muscular fibres of the blood-vessels, whereby vascular tension is relieved, and the demands made upon the propulsive powers of the heart lessened. When it is combined with aconite this desirable effect is intensified; but as there is equal risk of paralysis of the respiratory muscles occurring from its use in heart disease as in pneumonia, there is the same necessity for the addition of a little belladonna to counteract this tendency. Hence, in the more sthenic inflammations of the lining or investing membranes of the heart, such as commonly occur in acute rheumatism, and especially in their earlier stages, we shall usually find that aconite with opium and belladonna sensibly modifies the heart derangement; and if this derangement presents those symptoms which betoken approaching failure of its power, we shall do well to substitute digitalis for the opium, or increase the quantity of belladonna. When heart disease occurs in albuminuria and ichorhæmia, the viscus being supplied with impure blood has little resisting force, and must, from the first, be supported; and we know of no

more trustworthy cardiac tonic to effect this purpose than digitalis.

There are good grounds for believing that ammonia helps to counteract some of the unfavorable tendencies occasioned by loss of tonicity, as well as to answer many other important indications—such as stimulating the vaso-motory system, relieving partial and general congestions, unloading the vascular system by diaphoresis, and lessening the tendency to the formation of clot; so that in practice its use, conjointly with the sedatives enumerated above, is to be recommended, although so manifold a combination of drugs is scarcely consistent with scientific therapeutics.

In addition to the protective action of belladonna when in combination with opium, it possesses a special influence over several morbid conditions of the heart, which is most favorably displayed when the impulse is feeble and the circulatory system relaxed. In more sthenic conditions it is liable in even a greater degree than digitalis to prove too stimulating when administered alone; but when combined with aconite its effects, although not so uniformly satisfactory as those of digitalis, are often eminently beneficial, and it may for a season be substituted with great advantage for digitalis during the prolonged exhibition of that drug.

As a deduction from the above remarks it may be concluded that opium and belladonna are most serviceable in acute and digitalis in subacute forms of pericarditis and endocarditis; and that, when there is reason to believe that myocarditis is a source of heart inefficiency, the more tonic qualities of the latter will often be required to redress the balance between loss of tonicity and excessive irritability. With these sedatives aconite is to be combined in doses proportionate to the amount of pyrexia. In treating the chronic forms of these complaints and their numerous mechanical derangements, reliance is to be placed on digitalis and belladonna, the preference being given to the former as interfering less with the natural secretions and being better adapted for prolonged administration. At the same time there is no occasion to employ either of them to the exclusion of such general remedies as tonics, aperients, and the like. The diuretic action of digitalis and belladonna materially enhances the benefit derived

from their use, and helps to defer that general engorgement which slowly but inevitably creeps on during the progress of most of these diseases.

In those chronic forms of heart-disease which are especially characterised by atony of the muscular tissue, and which may be due either to interstitial deposit of fat or to idiopathic fatty degeneration, or may owe their origin to atrophy of the entire organ or to dilatation of its walls without corresponding hypertrophy, we may anticipate some degree of benefit from the exhibition of one or other of the specific cardiac tonics; but whatever sedatives are employed in any of these diseases, their effects must be watched with a jealous eye, as there is risk of the onset of some unexpected phase in the complaint which may render their use hazardous; for if given unadvisedly, they are liable to excite the organ beyond its feeble capacities, and ultimately produce that exhaustion which is the correlative of all over-stimulation. Nevertheless, it may be conceded that the primary, if not permanent, effect of opium, belladonna, and digitalis, when administered under proper conditions, is to strengthen and stimulate the heart.

There is no occasion to enlarge upon the necessity for the removal of all extraneous sources of irritation, the advantages of an easy position and of a mild equable temperature, the advisability of discretion not only in locomotion but also in the exercise of the voice; but we must never omit to enforce rest as an integral part of our treatment, in the chronic no less than in the acute forms of heart-disease.

We have already spoken at some length of the use of alcohol in pyrexia, and need not repeat what has been said respecting the propriety of its administration, but it may be suggested that its special stimulating effect upon the heart requires that it should be given in these complaints in a dilute form and limited quantity.

A departure from those sound deductions which ordinarily forbid bloodletting in acute disease may sometimes be justified when an accumulation of blood in the right heart results from pulmonary engorgement or obstruction to its egress from the left ventricle, and leads to dangerous distension; but the speedy and manifest relief which often ensues upon the abstraction of a few ounces of blood under these

circumstances, must not tempt us to have recourse to this extreme measure on every trifling recurrence of the threatening symptoms. The danger—and it is sometimes most urgent—has a mechanical origin, and requires removal by mechanical means; but in the use of the lancet in all severe illness we are drawing fearfully on our diminished resources, and impoverishing organs already sufficiently ill-nourished, and at the same time increasing that tendency to fibrillation which is so fertile a source of danger.

If acute rheumatism, as is most frequently the case, be the cause of the cardiac mischief, blisters should be freely applied to the inflamed joints. I am able to subscribe myself as a witness to the efficacy of blisters in this painful disorder, and so favorable have been the results of their employment in my hands that I would as soon think of dispensing with quinine in ague as with them in this complaint. When freely applied to the seat of pain they seldom fail to afford speedy relief, and in the majority of instances appear to curtail the duration of the attack; and I am not without evidence that they diminish the tendency to metastasis. There is no advantage in applying them to the præcordia unless the heart be affected, and as they increase the difficulty of auscultation it is better to defer their application to that region until symptoms of cardiac disturbance become manifested. For convenience of application and uniformity of action the *Liquor Epispasticus* of the British Pharmacopœia is preferable to most of the fluid and all the solid preparations of cantharides. It may be deemed somewhat incongruous to discuss the merits of blisters in this article, but their extraordinary ease-bringing qualities in this agonising disorder and in very many of the most obstinate kinds of chronic rheumatism, gout, and other neuroses, give them a reasonable claim to consideration in a desultory monograph on sedatives. It would appear that in some instances at least (*e. g.* *sciatica*) the relief from pain afforded by blistering is due to the removal by absorption of certain morbid exudations which press upon the nerves.

There are those who pin their faith exclusively on opium in acute rheumatism, but after witnessing, many years ago, a rapidly fatal termination to a case of this disease, which was treated in Guy's Hospital with this drug alone, and which

presented no exceptional severity from cardiac or cerebral complications, I have ever been reluctant to trust solely to it.

The following case, given below in some detail, is instructive, as it serves to illustrate the use of sedatives in a severe attack of heart disease complicated by peritonitis.

Ellen G—, a domestic servant, æt. 18, came under my care on the 1st March, 1876. She was recovering from what she called “bilious fever,” when she perceived that her legs were becoming swollen and her breathing affected.

On examination I found the skin hot and dry; the temperature 102° , the pulse 134, irregular; respiration 40, with orthopnoea; the face puffed and dusky, and the legs slightly œdematous. There was no abnormal præcordial dulness, but a faint systolic murmur about the apex pointed to mitral insufficiency. There was congestion of the bases of both lungs and a constant short dry cough. The urine was dark and scanty, loaded with phosphates, but free from albumen; sp. gr. 1026; the liver somewhat tender and enlarged. There was no history of acute rheumatism, but “heart disease was in the family.”

After a podophyllin aperient a mixture containing \mathfrak{zss} of recent infusion of digitalis, \mathfrak{mij} of tincture of aconite, and \mathfrak{zij} of the solution of the acetate of ammonia, was ordered every two hours, with a limited quantity of spoon-food and a little weak whiskey-and-water at regular intervals alternating with the mixture.

March 5th.—The bowels, skin, and kidneys were acting freely, the pulse reduced to 112, irregular; the lung sounds clearer, the respiration 36; temperature 100° , the orthopnoea and congestion about the face relieved. The treatment to be continued, but the mixture to be now taken every three hours.

10th.—Some arrest to the action of the skin and kidneys had followed upon imprudent exposure, in consequence of which much fever with rapid pulse (about 150) and greatly impeded respiration were present. A hot bath, under proper precautions, was ordered. The aperient was repeated, and the mixture again taken every two hours. The amount

of liquid taken was reduced to the lowest limit compatible with proper support.

11th.—There was diffused pain and great intolerance of pressure over the entire abdomen, which was tympanitic. The pulse was 145, weak and wavering; the respiration shallow and very rapid, and thirst great. There was also retching, which would have been both violent and frequent had the abdominal pain permitted. Ordered to take one grain of opium night and morning, continue the mixture, without the ammonia, suck a limited quantity of ice, and substitute weak brandy-and-water for whiskey-and-water; the abdomen to be covered with a liniment of belladonna, chloroform and olive oil applied on lint.

15th.—The abdominal pain, the tympanitis, and sickness diminishing. The skin beginning to act, the pulse 140, irregular; and the breathing less shallow and rapid. Complains much of sleeplessness. To have a hot bath at night and continue the treatment.

17th.—The skin acting profusely. Pulse 125; respiration 35. No retching. Able to take a little milk and brandy-and-water. To take a mixture containing ʒj of infusion of digitalis and ℥v of tincture of belladonna every four hours, and continue the opium night and morning, but leave off the belladonna liniment.

20th.—No abdominal pain, even on pressure. Pulse and respiration reduced. Secretions natural. To continue the mixture and diminish the opium by one half.

28th.—Pulse 95, regular. Sleeps and eats well. No oedema of the legs. To take ℥v of the tincture of the perchloride of iron thrice a day with food, and discontinue other medicines and the stimulant.

April 30th.—Convalescent. Systolic murmur still audible, and breathing short on exertion. To rest for a couple of months, and take ℥x of the tincture of iron twice a day for the same period.

It is not, however, in these more definite departures from health, in which the lines of treatment may be laid down with tolerable precision, that we find the sole or even principal use of sedatives, but rather in those frequent and often recur-

rent attacks of pain and uneasiness which are mostly due to the grafting of the abuses of modern life on a people exposed to a damp and changeable climate. The more typical of these neuroses may be referred to syphilis, gout, rheumatism, ague, alcoholism, or some other constitutional taint. Each of them has its special treatment, and all require that careful sanitation and diet which are essential to the restoration of depraved nerve-tissue; but in their most familiar forms they are chronic, and very tardy in yielding to remedies; and the constant wearing pain which is common to them all demands some respite, during the night at least. There are some general maxims which may be adopted with advantage in attempting the relief of these distressing disorders, and they are simple in themselves and usually successful. Having brought the sufferer under the appropriate specific treatment, it is advisable when practicable to try the effect of local sedative applications before having recourse to them internally. Should the pain be accompanied by a weak circulation, or if freedom from heat, throbbing, and swelling bespeak its non-inflammatory character, a stimulating embrocation, in which chloroform and opium are ingredients, should be used; but in the more passive pains of myalgic origin the invigorating effect of brisk rubbing-in with the naked hand of some such simple stimulating fluid as sea-water, or any of its artificial substitutes, will, when persevered in with sufficient energy, be more likely to confer permanent relief from pain, by restoring that vigour to the muscles the loss of which has induced the myalgia. In those severe pains in which so-called inflammatory action is at work, and in which a local stagnation in the circulation has occurred either from excess in the arterial supply or defect in the carrying power of the veins, warm and moist applications combined with a sedative are most serviceable, as they tend to relieve the congestion by relaxing the constricted veins, and unload the general circulation through diaphoresis. The sedative best adapted for this purpose is opium, as its specific action on the vaso-motory system powerfully promotes dilatation of the blood-vessels and diaphoresis; and if we would obtain its full benefits in the more painful local congestions it will be well to combine its internal with its external exhibition.

Excess of weight in all applications is to be avoided, for large heavy fomentations not seldom neutralise their good effects by fatiguing the structures on which they rest. Thin layers of spongio-piline are sufficiently absorbent, and may be made very retentive of heat, and they are to be recommended in preference to the ordinary poultice or fomentation. But what is of far greater importance than the mode of application is the strength of the sedative employed, which more often errs through deficiency than excess. If a decided sedative effect is to be produced in an adult by an application to the skin, not less than ʒj of the extract of opium or ʒss of the extract of belladonna should be dissolved in ʒj of the menstruum; and when an especially rapid and thorough absorption is required, a concentrated solution of the sedative in chloroform, with an equal quantity of alcohol added, should be employed. Strong solutions of aconitina and atropia thus prepared have a very numbing effect upon some neuralgias in which the cutaneous branches of the nerves participate, and may be freely painted upon the painful spot if it be without abrasion; and when temporary relief fails from these local measures, it is more often due to a want of perseverance on the part of the sufferer than to the inefficacy of the remedy. Undoubtedly the external exhibition of sedatives will sometimes fail even when the seat of pain is superficial and the remedy has been applied in a suitable form and adequate strength, and we are then compelled to administer them internally; under these circumstances it will be found that their employment in active and passive inflammations is not without its parallel in their internal administration in acute and chronic neuroses; and it is not a little encouraging to find that, by persevering in a sedative treatment, the occasional interruption which occurs to the supremacy of even the most chronic neuralgias will often result in its total abdication.

The singular curative power exercised by opium over chronic ulcers of the lower extremities suggests its mode of operation in many pains which have their origin in malnutrition of the nervous tissues. Under its employment we may observe foul and excavated ulcers, even in broken-down constitutions, assume a healthy appearance, gradually fill up, and become obliterated; and it is probable that in removing

a chronic pain and in healing a chronic ulcer with opium we see exemplified that supporting and restorative action of the drug to which I have already adverted, and which is chiefly due to its influence on the sympathetic system.

Two old-fashioned topical remedies, the plasters of opium and belladonna, fell into undeserved disrepute with me, as I could not but be sceptical as to the advantage derived from the minute quantity of either drug which could by any possibility be absorbed when brought into contact with the skin in an almost insoluble form; but my patients corrected the misconception by persisting in deriving benefit from their application, in spite of *à priori* presumptions; and I found it desirable to return to their use in many of those most obstinate aches and pains of an indefinite character to which people with the gouty or rheumatic diathesis are so subject.

It is very possible that their good effects are solely due to the prolonged protection against the vicissitudes of weather afforded by the leather basis of the plasters, and to the mechanical support they lend to feeble muscles; but be it as it may we shall, in my opinion, do well not to discard these trustworthy agents because they are somewhat suggestive of bygone practice.

The specific action of sedatives in acute and chronic inflammations, and the more obvious control exercised by them over pain, do not by any means exhaust the catalogue of their good deeds; for there is an altogether distinct class of disorders whose predominant symptom is sleeplessness, for which they may be prescribed with no less confidence and success. It is not compatible with the tenor of these remarks to go into so special a question as the use of sedatives in insanity, but it is within the experience of all practitioners that the border-land which lies between sanity and insanity is often invaded by many who, but for the timely administration of sedatives, would inevitably overstep the boundaries.

In recalling the treatment pursued in such cases so comparatively short a time since as twenty years ago one cannot fail to be impressed by the difficulties which had to be surmounted in providing that repose which was indispensable; and even in those more ordinary sufferings from insomnia incidental to

mental overstrain, domestic or business anxieties, and other familiar causes, after we had prescribed tonics, change of scene, and strict attention to diet, our means of cure were exhausted; and the unrelieved and dissatisfied sufferer not improbably fell into the hands of the hydropathic or some other encroacher on the domains of legitimate practice, and perhaps obtained, through the diversion of the mind into unaccustomed channels, that boon which it was not in our power to bestow; or sometimes the termination of the attack in organic brain mischief proved that his complaints of sleeplessness were based upon real objective disease. At that epoch—rendered so remote by the swift march of science—we were without the aid of those specifics for insomnia—hydrate of chloral and the bromides—we now glory in, and were compelled to trust to such inferior hypnotics as henbane and humulus; which were not only inefficient but even injurious, as they too often increased the mischief by aggravating the dyspepsia which was the usual concomitant of the insomnia. In contrast to this we are now able, by the free and, if necessary, frequent use of the bromides and hydrate of chloral—either alone or in combination—to provide, in almost all cases of insomnia unaccompanied by organic brain disease, sufficient sleep to satisfy the requirements of nature, and afford opportunity for the slow but sure healing powers of time to work a cure: and even when the brain has suffered some irreparable injury we may still lighten the blow and calm its susceptibilities by means of the same soothing remedies.

The following case is a type of a class of cases which are as common as “that loss is common to the race;” but it has its interest in the persistence of the insomnia, the necessity there was for the prolonged administration of sedatives, and their ultimate success. Rather more than a year ago a lady, whom we will call Mrs. A—, consulted me on account of wakefulness and nervous apprehensions. Such infrequent sleep as she obtained was disturbed by horrific visions, and so distressing were these dreams that she was in the habit of sitting up the whole night long in order to escape them. This condition followed upon the sudden and unexpected death of her husband; and was accompanied by anorexia

loaded tongue, foul breath, constipation, and other signs of digestive disturbance. Her mind appeared totally unhinged, and she was a prey to terror; and from some remarks she let fall about the deceased visiting her, it was a charitable construction upon her conduct to say she was sane. The change of scene which was suggested was inapplicable, from her dread of leaving home in consequence of her husband having died when on a visit at the seaside. Chloral and bromide of ammonium were prescribed in such quantities as to insure sleep, the digestive organs were attended to, and such distractions as were at command were brought to bear upon her, but apparently without the least benefit. The society of cheerful friends, exercise in the open air, and domestic occupation caused no healthy diversion to her thoughts, and for many months comfortable sleep was never obtained unless under the influence of the sedatives. These I did not fail to push, as I considered her condition far too critical to admit of halting measures. After waiting eight or nine months I had the pleasure of seeing the mind recover its native tone, and bodily health restored; and, what was interesting, regret for her husband which had been in abeyance or only existed as a morbid fear, was now felt intensely and naturally. There can be no doubt that in this instance the mind long hovered on the verge of insanity, if it did not pass beyond it, and the artificially induced sleep she obtained alone kept her from being pronounced a mad-woman. It is impossible to estimate the comfort of this to the lady and her friends.

In this case the method of prescribing the sedatives was one which I consider especially beneficial. A scruple of bromide of ammonium was ordered twice a day, and a moderate dose of hydrate of chloral (about ʒj) at bedtime, so as to allow the influence of natural rest to come into play. On this failing, as was more often the case in this instance, three doses, each containing a scruple or more of the bromide and an equal quantity of chloral, were given successively at intervals of twenty minutes, until sleep supervened. It has been well suggested that in administering opiates and some other medicines very small doses should be given at short intervals until the desired effect is produced, but in the milder forms of

illness this plan has the serious drawback of requiring the attendance of a nurse, as it is most unsafe to trust the administration of a powerful medicine to a person who is becoming more and more drowsy under its influence. Such a procedure, too, is quite unsuited to the hydrate of chloral, which must always be given in a considerable quantity when employed to produce sleep, as its action is both rapid and transitory. Its sleep-producing qualities would seem to depend upon its power of bringing the brain into the condition it assumes in natural sleep, whereby the disinclination to sleep which characterises insomnia is overcome; and so natural is the sleep produced by it that we find no unpleasant symptoms are attendant upon our waking hours, or even when we are aroused, when under its influence, during the night.

Mr. B— frequently suffers from an over-taxed brain, especially about quarter-day, when he is much exercised by business calculations. He comes to complain to me of most harassing sleeplessness, which is often accompanied by giddiness and vomiting. I find his pulse quick, soft, and sometimes intermitting, his tongue coated with thick creamy fur, and the vertex hot. In the more severe attacks I have observed symptoms of more grave import—a flaccidity of the lower lip on one side, and slight hesitation in speech. He describes his restlessness as intolerable, and declares that he sometimes passes as much as four nights and days absolutely without sleep, and I have no reason to doubt the perfect accuracy of the statement. The share-market is the cause of his attacks; and go where he may, he unfortunately cannot get it off his mind; and sometimes he is so disturbed by its fluctuations that very powerful doses of the chloral and bromide fail to produce oblivion, and we have to wait for brighter days. Nevertheless (and this is the important point) these sedatives are not without their use, even when they fail to bring sleep; for they assuredly benefit him to the extent of enabling him to undergo the worry of business without utterly breaking down. Other sedatives have been repeatedly tried, but have egregiously failed if they have not aggravated his sufferings. Again and again I have Mr. B— under my care, as he will not or cannot escape from the position which brings upon him this constant trouble.

What may be considered a condition of restlessness, although scarcely recognised as such, is often witnessed in those who sleep long and heavily and wake unrefreshed. When sleep of this character results from over-feeding, it merely requires moderation in diet with a sufficiency of exercise; but it may be due to excessive mental application, and is not unfrequently observed in clever ambitious schoolboys. If their sleep is watched it will be found to be disturbed by tossings and muttering, in which respects it differs from the more stertorous sleep of the glutton. It often proves a great hindrance to the acquisition of knowledge, as it leaves the brain in waking hours weary and lethargic; and it is a fruitful source of headaches. Prolonged anxiety often leads to a similar condition; and we may presume that the brain, over-excited by excessive application to study or by constantly dwelling on its troubles, still carries on in sleep its waking train of thought, although no remembrance of it is retained, and thus misses that rest which is required for its proper restoration. A draught of the bromide of ammonium and a little aromatic spirits of ammonia at bedtime, and a more moderate application to books on the one hand or a brave wrestling with care on the other, can scarcely fail to restore sound sleep. When over-activity of the brain at the season when it should be quiescent is the cause of insomnia, an annoyance which not uncommonly affects studious men who read far into the night—a meal of nourishing food of a kind which rapidly stimulates the digestive organs will cause such a diversion of blood from the head to the stomach as will induce the requisite stagnation in the brain, and cause sleep; and in delicate people and those recovering from exhausting illness a not very dissimilar condition of the brain requires similar treatment.

As a trifling matter, but not on this account beneath the physiologist's notice, the influence of position may be considered. Not only should it be such as from the relaxed condition of the entire voluntary muscular system would court repose, but I am inclined to believe (in opposition to the usually received opinion) that the position assumed by the head should be such as to discourage the too ready escape of the exhaled carbonic acid. This idea is founded on a consideration of the sleep of many of the higher animals, some of

which retire to dens and other restricted spots, while our domestic animals will be found to bury their muzzles in such a manner beneath their fore-limbs as to interfere greatly with the escape of the products of respiration. These remarks I would merely wish to throw out as a suggestion, but in considering the question the soporific effect of carbonic acid should not be overlooked.

Timid excitable children are often composed by having a young bed-fellow with them, or a dim light may serve to ward off the imaginary foes with which an over-active brain often peoples the room; but as the latter expedient in its neutralisation of the darkness of night can scarcely be natural, and as it is liable to lead to a confirmed habit, it is better to have recourse to a mild chloral sedative occasionally, which if judiciously given will cultivate a disposition to sleep at the proper hour, and need never become habitual. The necessity of sleep for children is so urgent that we are justified in treating its frequent deprivation as a serious disorder requiring unhesitating measures for its relief.

I have employed chloral hydrate much and freely; I have given it to the old and young, to the strong and the weak, and have never known any serious results follow from its use. That the administration of so powerful a drug, so extensively taken, under so great a variety of circumstances, should always be exempt from untoward consequences is not to be expected, and were it so would differ from our experience of all other medicines of any potency. Let it satisfy us that we have ever at hand an agent which is capable of producing sleep, so comfortable and so refreshing, that it is impossible to distinguish it from the perfect sleep of perfect health. Much might be said on the subject of hypodermic injection, but its use is so well recognised and its administration so thoroughly understood that I deemed it might be considered nothing less than an impertinence for me to attempt to throw any additional light on a subject which every text-book in medicine, surgery, and therapeutics so fully elucidates.

ON

THE NERVOUS SYSTEM IN DIABETES.

By FREDERICK TAYLOR, M.D.,

AND

JAMES F. GOODHART, M.D.

WITHIN the last few years the pathological histology of the brain and spinal cord has been the subject of much study, and in every disease in which these parts could be supposed to be at fault they have been examined with ever-increasing minuteness and more and more definite results. It is especially in the morbid anatomy of mental diseases that the greatest amount of work has been done, in the endeavour to find with the microscope the minute alterations of the grey matter which were not visible with the naked eye; and it is here also that the results have been most satisfactory in that in chronic insanity, and especially in general paralysis, various changes indicating overgrowth of connective-tissue structures at the expense of nerve elements have been constantly found. On the other hand, when one turns to some more acute diseases, profoundly involving, indeed originating in the central nervous system, and leading to much more striking symptoms, one obtains only results which are at best uncertain and contradictory. We refer here to tetanus and hydrophobia, which

have provided material for examinations at any rate as careful as those of the brain in the various forms of insanity, if not so numerous (though this may well be doubted in the case of tetanus) on account of the less frequency of the diseases. In tetanus, for instance, the position is still most unsatisfactory; some observers have described in the minutest manner alterations of vessels, of connective tissue, and of ganglion cells, and Dr. Allbutt has enumerated no less than eight lesions of the kind, whilst others have positively refused to see anything different from normal anatomy.

Again, the last-named writer has described in hydrophobia distension of vessels and thickening of their walls, with here and there patches of nuclear proliferation, as well as hæmorrhages, and "little gaps caused by the disappearance of nerve strands which had passed through the granular disintegration of Clarke,"¹ while many others must have found nothing, or we should surely have heard about it.² In any case the subject is surrounded with many difficulties, which are only to be met by special skill in manipulation, and by a perfect acquaintance with normal histology, both in its wide variations within healthy limits, and its altered aspect under the influence of the different reagents necessarily employed.

One must guard against claiming as disease what is really a condition of health; especially in the case of the central nervous system, where differentiation of structure is carried to a high degree, nerve-cells varying in shape, size, and contents according to the region in which they are situate. The effects of advancing age upon the tissues require to be studied; and with all the more diligence, when we consider that senility passes by insensible gradations into disease. Lastly, one must be careful to avoid the error of attributing to disease the physical and chemical alterations which occur post-mortem, whether spontaneously and naturally arising, or brought about artificially by the use of reagents. An illustration of the last fallacy has been recently afforded by the investigations into

¹ 'Path. Trans.,' vol. xxiii, 1872, p. 17.

² A case of hydrophobia in a boy of thirteen, recorded by Dr. Wickham Legg in 'St. Bartholomew's Hospital Reports,' vol. xii, 1876, p. 262 *et seq.* The cord was submitted to Dr. Gowers, and though it was considerably damaged by post-mortem disintegration the examination showed that there was little abnormal.

the nature of sheep-pox by one of our most experienced microscopists.¹

In view of the difficulty of all such investigations and the chances of errors which they present it is clear that the greatest progress will be made if new observations be accepted only provisionally, and be not regarded with too great affection, until they have been confirmed by other investigations or in fresh cases; indeed here, as under many other circumstances, "the more haste the less speed."

Among the observations which appear to us to stand in the position of the unconfirmed are those of Dr. Dickinson on diabetes;¹ and as we have had the opportunity of securing within the last twelve months the brains and spinal cords of nine diabetic patients, we have devoted some time and care to the examination of the points in which he has stated that the nervous system in diabetes differs from that in health. Incidentally, of course, we have not neglected in each case to look for the tumours and softenings of the medulla oblongata which have in a few isolated instances been described by Luys, Levrat-Pelloton, and others; but they stand in a different position from the alterations attested by Dickinson; that is to say, that the very coarseness of the changes discovered by the former forces us to recognise that they are absent in the great majority of cases, and one can therefore obtain no more from such facts than the suggestion that a functional disturbance, if not a structural lesion of a corresponding part of the brain, is the primary cause in all other cases. To hint that diabetes was invariably due to tumour or softening would be to ignore the strongest evidence to the contrary. On the other hand, Dr. Dickinson, since he commenced his investigations, seems never to have failed in finding the alterations which he describes; and he therefore cannot help coming to the conclusion that they are intimately associated with the pathology of diabetes. Indeed, not only does he in so many words

¹ Klein, 'Proc. Roy. Soc.,' vol. xxv, No. 174, p. 259; Creighton, 'Proc. Roy. Soc.,' vol. xxv, No. 172, p. 140.

² "On Certain Morbid Changes in the Nervous System associated with Diabetes," by W. H. Dickinson, M.D., 'Med.-Chir. Trans.,' vol. liii, 1870, p. 233; "Diseases of the Kidney and Urinary Derangements," by W. H. Dickinson, M.D., Part I, 'Diabetes,' 1875.

assert this concurrence, but in a subsequent argument he concludes that the histological changes are "the initial fact of the disorder of which glycosuria is the leading symptom."¹ With this argument, however, we have at present little to do; we are only concerned to investigate his announcement of the constant existence of morbid alterations in the central nervous system.

It will be desirable to give here the summary of his observations as it stands in the '*Medico-Chirurgical Transactions*' (vol. liii, 1870, pp. 251, 252), which, although written so long as seven years ago, is obviously endorsed by him in his later work, published in 1875, and containing allusions in all to eleven cases. The passage is as follows:—

"The results obtained in the five cases examined are briefly these: peculiar morbid changes were constantly found in the cerebro-spinal system. In all the alterations were of the same nature and in similar situations. The earliest alterations recognised consisted in a dilatation of the blood-vessels, particularly of the arteries, with accumulation and frequent extravasation of their contents. The next was a degeneration of the nervous matter at certain points outside the swollen vessels, probably caused by the intrusion into it of blood-corpuscles. The degenerative process occasioned destruction and excavation of the tissue round the vessel. Cavities were thus produced, often large enough to be striking objects even without the microscope, which contained blood-vessels, extravasated blood, grains of pigment, and the products of nervous decay. Finally, the contents appeared to become absorbed, so that simple vacuities were left. The perivascular sheath was variously stretched and altered in character and became loaded with pigment, but it seemed that these alterations were consequent upon the dilatation of the vessel, extravasation of blood, and excavation of nervous matter.

"As to their situations the changes occurred in constant association with arteries. They were found in every part of the spinal cord and encephalon, attaining their greatest development in the medulla oblongata and pons Varolii. The excavations were generally the most marked where the blood-vessels piercing the brain were the largest and most numerous.

¹ '*Diabetes*,' 1875, p. 45.

They were frequently in connection with folds of the pia mater. The regions affected with the greatest frequency were the olivary bodies, the vicinity of the median plane of the medulla, the grey matter of the floor of the fourth ventricle, a fissure just internal to the origin of the facial nerve which lodges a process of pia mater, and a depression similarly occupied which penetrates from between the anterior crura towards the centre of the pons Varolii.

“The optic thalami and corpora striata were involved though to a comparatively slight extent. The septum of the ventricles and the white matter of the convolutions displayed the alterations in a remarkable manner. The changes especially affected the white matter, though the grey matter at the floor of the fourth ventricle and of the spinal cord are exceptions to this statement.

“In the cord the most conspicuous change was the enlargement of the central canal probably connected with degeneration of tissue, of which many evidences were found there and elsewhere.

“The nerve-cells of the brain and spinal cord were generally perfect.

“Such parts of the sympathetic systems as were examined, namely, the upper cervical and semilunar ganglia, were apparently natural.”

It will be sufficient here merely to state that our own results do not agree with those of Dr. Dickinson above recorded; but the full discussion of the points of difference between us we must defer until after the recital of the cases on which our observations will be founded.

The cases occurred in Guy's Hospital, and we are indebted to the kindness of the several physicians in whose charge they were for permission to publish them. The clinical reports have been condensed so as to leave little more than what was sufficient to testify to the nature, form, and duration of the disease; and it will be seen that in the examination of the parts we have paid careful attention to the naked-eye appearances. This was in consequence of the statements of Dr. Dickinson; as for instance, in the above extract, where he says, “Cavities were thus produced often large enough to be striking objects even without the microscope;” and again in his

later work,¹ "The microscope is not necessary for their detection, though it is for their description," and, "Large excavations, and pores in cribriform arrangement, thus become evident to the naked eye which the microscope will explain in detail."

CASE 1. *Diabetes ; collapse and coma.* (Reported by Mr. G. H. Parry.)—Frederick P—, æt. 15, was admitted September 18th, 1876, into Stephen ward under Dr. Taylor, then in charge of Dr. Pavy's cases. He was a leather dyer by trade and gave a good family history. Five years ago he had abscesses round his neck and face; they healed up after three years and have not returned. Five weeks ago he had gonorrhœa, with a bubo. It appears to have been about the same time that he first felt very thirsty, and three weeks ago he noticed that his urine was very abundant, amounting to seven or eight pints in the twenty-four hours. Lately also he has lost flesh and strength, and has not been able to work the last three weeks.

On admission he has a rather large head, scanty hair, fair complexion, and flushed face. The tongue is red and dry, and the bowels are confined, not having been open for ten days. He complains of sinking at the pit of the stomach, the pulse is 100 and very feeble, the resp. 36, and sighing, the temp. 97·2° Fah.; the urine is pale, of sp. gr. 1032, contains no albumen, but is loaded with sugar. The viscera present nothing unusual. He has gonorrhœa still. Ten grains of colocynth and calomel pill were ordered, and on September 20th he was placed on restricted diet.

From the first he had an appearance of great exhaustion, and the respiration was deep and sighing.

On the 21st his collapsed condition had increased, he had scarcely eaten any of his bread, and would not take his beef tea. He complained of constriction across the chest. Pulse 128; resp. 36; temp. 95·6°.

Later in the day his condition was worse; he was drowsy, but could be roused; the surface was livid, the extremities were cold. It was determined to try the effect of injection of a saline solution of low specific gravity,² and accordingly at

¹ Loc. cit., 1875, p. 33.

² See "A Case of Diabetic Coma treated with Partial Success by the Injec-

4.20 p.m. the house-surgeon opened a vein in the right arm, and 30 ounces of a solution of phosphate and chloride of sodium were injected into it by means of an Aveling's syringe. He was but very little improved by it, and at 9 a. m. on the 22nd he died.

The pons Varolii, medulla oblongata, spinal cord, and portions of the brain were placed in chromic acid, after a few days' stay in spirit. When sufficiently hard, sections were made at different levels, and the exposed surfaces carefully examined by the naked eye and with a hand lens. Thin sections were also taken from all parts, and after staining with carmine or logwood and clearing with spirit and oil of cloves were examined microscopically.

To begin with the naked-eye examination: a horizontal section of the *pons Varolii* was made just immediately above the medulla oblongata, and therefore involving the origins of the facial nerves. It showed in the median line a branched elongated cavity measuring $3\frac{1}{2}$ mm. greatest length, by 1 mm. greatest breadth; it was $\frac{1}{5}$ inch from the anterior border, and $\frac{2}{5}$ inch from the posterior border of the section. Its walls might be regarded as ragged, and it obviously contained vessels. On the left side was another oval cavity, looking much more ragged, 3 mm. by 2 mm., also containing vessels, and situate at the root of the facial nerve (in precisely the same situation as the hole represented in Dr. Dickinson's figure, plate viii, Nos. 3 and 4 ('Med.-Chir. Trans.,' 1870); on the opposite side the corresponding position was occupied by an open angle between the bulk of the section and the seventh nerve: this space also contained abundance of vessels in connection with the pia mater on the surface. On turning over the piece of the pons under examination it was seen that these apertures were in complete continuity with the outer surface, being only the deepest corners of the very deep depressions between the pons and medulla, the depth of which is due to the overhanging of the transverse fibres of the pons. A section of pons higher up showed another aperture which was in immediate connection with the exterior. A section of the *medulla*

tion of a Saline Solution into the Blood," by C. Hilton Fagge, M.D., 'Guy's Hospital Reports,' vol. xix, 1874, p. 173; and "A Case of Diabetic Coma," by Frederick Taylor, M.D.; *ibid.*, p. 521,

oblongata 5 mm. below the pons, and therefore through the olivary bodies, showed no holes, excavations, or cavities in any part except the grey matter of the floor of the fourth ventricle.

Here there were seen on careful examination five or six holes, circular, certainly not larger than $\frac{1}{250}$ inch, and situate in the grey matter forming the nuclei of the nerves.

A section one millimètre above the point of the calamus scriptorius showed a large vessel running through the olivary nucleus in the course of the root fibres of the hypoglossal nerve; also a moderately large vessel in the median raphé, 3 mm. from the anterior margin. They did not, however, appear any larger than what we have seen in other bulbs presumably healthy. A section 7 mm. below the obex, just at the lowest part of the medulla, where the decussation is still incomplete, and the tubercles of Rolando are just developed, showed not a trace of disease. In one section of cervical *spinal cord* the neck of one anterior cornu was irregular, that is to say, there was an aperture $\frac{1}{2}$ mm. in diameter, communicating with the anterior fissure. It did not appear any larger than what may be often seen in healthy cords. In other parts of the cord we noted that apertures for the vessels were occasionally well marked, and estimated their size. Thus in the dorsal portion, a pin-point hole, $\frac{1}{250}$ in. in one anterior cornu: on the other side of the central canal a commissural vessel hole slightly bigger ($\frac{1}{150}$ in.). In the upper dorsal region a commissural vessel hole, $\frac{1}{125}$ in. long; lower down an oval vessel cavity, $\frac{1}{40}$ in. by $\frac{1}{50}$ in. In one section was observed an orange-yellow colour at the bottom of the anterior fissure.

Returning to the encephalon, we found a high section through the pons, opposite the velum medullare posticum, showed a perfectly normal surface. A portion of a convolution of the cerebrum was to the naked eye quite healthy, not in any way cribriform, and portions of the corpus striatum, optic thalamus, and adjacent hemisphere were equally free from abnormality.

Numerous sections from the cerebral convolutions, medulla oblongata, and spinal cord were examined microscopically, with especial reference to the changes described by Dr. Dickinson. We could not find the slightest evidence of dilatation of the vessels; they appeared of ordinary size, and of natural structure; they were quite uniform in calibre when

traced to any length, and they held a proportion to the perivascular space, which was not different from that usually seen in healthy nerve tissues. Thus, where the vessel stood open, the relation of the space to the vessel was never greater than as 2 : 1; but one vessel in the medulla was shrunken, and here the proportion was 4 : 1. On a few vessels were found yellowish unorganised, perhaps crystalline bodies; but the vessels were always in other respects perfectly normal, as well as the surrounding nerve tissue. In the medulla, both the median raphé and olivary bodies showed, as usual, vessels of considerable size; they were, however, no bigger than in health, and presented no evidence that they had been smaller prior to the disease of the individual. The nuclei in the floor of the fourth ventricle were quite natural. In the spinal cord the largest central vessel space measured $\frac{1}{135}$ in. by $\frac{1}{20}$ in., and the largest vessel measured $\frac{1}{330}$ in. in diameter. The relation between the spaces and the contained vessels was never more than 3 : 1.

All the parts examined contained great numbers of the round and oval bodies described as "miliary degeneration" or "miliary sclerosis."¹ They were situate in the white substance of the convolutions, and in both white and grey matter of the other parts; they were transparent, structureless, unstained by carmine, and appeared rather to displace than to destroy the nerve tissues in which they were found. With the exception of this change, which is well known to nerve pathologists, and is found in many diseases, we could not see any evidence of dilatation of arteries, of extravasation of contents, at least into the nerve substance, of degeneration, or "excavation" of nerve tissues. The nerve-cells, cerebral and spinal, were perfectly healthy. The central canal of the spinal cord was not enlarged, but was choked, as is frequently found to be the case in healthy cords, with cells and nuclei.

CASE 2. *Diabetes* (reported by Mr. E. Duke).—Charles C—, æt. 27, was admitted into Clinical ward, under Dr. F. Taylor, May 15th, 1876. He gave a good family history; he had been married about a year and a half, and had one healthy child. Nine weeks ago a rash came out all over

¹ See footnote, p. 441.

him, and lasted three or four days; at the same time his face, arms, and legs swelled. Six weeks ago he became very thirsty, and drank a good deal; at the same time he had an unpleasant taste in his mouth; the urine increased in quantity, and he thinks he passed no less than a gallon daily. Formerly he slept well, but the last fourteen days has been disturbed frequently in the night by the desire to micturate. His appetite was good until two or three weeks ago, since when he has eaten scarcely anything. His bowels have become more and more confined since the onset of his illness, and now have not been open for nearly a week.

On admission he has a wasted face, prominent features, and careworn expression. He feels weak, has no appetite, and does not enjoy what he drinks. The first sound of the heart is loud, the second scarcely audible. The lungs and abdominal viscera appear normal. The urine is of specific gravity 1028, and contains more than sixty grains of sugar to the ounce. Pulse 134, small and feeble.

At 5 p.m. he was throwing himself about in the bed, kicking off the bedclothes: often dozing off, but easily roused, and then talking rationally. He asked, indeed, if he was likely to live, and desired that his wife might be with him. The features were even more sunken than in the morning; the tongue and lips dry, so that some food he attempted to take was rejected unswallowed. The pulse was small, feeble and rapid; the heart beating violently against the thin chest walls; the sounds as before. Respiration was deep and sighing, the chest being well filled; resonance and vesicular murmur were normal. The surface was cool, a little sweat on the face, the hands and feet red from stagnation of blood, but not yet livid or purple. His bowels were opened by an enema of turpentine and croton oil, and he was ordered beef tea and milk *ad libitum*, and six ounces of brandy.

At 9 p.m. he was in a very similar condition, but quiet, as if asleep; the same rapid pulse, and deep sighing respiration. During the night he was very restless, and he died at 7 a.m.

The post-mortem was made by Dr. Hilton Fagge.

The brain was firm and appeared quite healthy. The lungs were quite healthy. The liver brown, homogeneous, and

extraordinarily hard, but without any evident excess of fibrous tissue. The kidneys weighed thirteen ounces; they also were very hard, and their cortical parts yellow and fatty.

On examining the portions of brain, &c., after hardening, one of these was found to consist of the *crura cerebri*, with a portion of the *pons* attached: the lower cut surface of this was perfectly normal in all respects. It is true that by continuing to take slices from this lower surface, one at length opened up a considerable cavity, measuring $1\frac{1}{2}$ mm. in diameter, and situate one and a quarter inch from the anterior border of the section. Compare Dickinson in 'Med.-Chir. Trans.,' plate vii, fig. 3. This became larger as the sections advanced, and was clearly only the extremity of the very deep pit between the *crura cerebri*, which is the means of transmitting large vessels to the substance of the *pons*.

Other sections at the top and middle of the *pons* showed nothing abnormal, whether in the anterior white or the posterior grey area. Sections, carefully made at and near the junction of the *pons* and *medulla*, and hence in the neighbourhood of the seventh nerves, enabled one to recognise the very deep depressions in the middle line and behind the olivaries, which allow the entrance of vessels into the substance of the organ. The upper surface of the medullary portion presented no hole or cavity except one or two elongated and very narrow apertures, which were obviously vessel tracks, and certainly no bigger than is usual in health.

Other sections of the *medulla* showed absolutely nothing abnormal, and the *spinal cord* was equally natural. Here and there the commissural vessel-spaces were large, but not more so than is frequently seen in healthy cords.

Sections from the convolutions of the cerebellum, and from the *pons*, *medulla oblongata*, and cord at different points were examined under the microscope. There was really nothing to note. The vessels were large at certain parts of the nervous system, but no larger than is usual in these situations; they were uniform in calibre, and the relation of the spaces to the vessels was never more than as 2 : 1. The largest perivascular space in the median raphé of the *medulla* was $\frac{1}{75}$ in. in diameter. In the cord one of the central vascular spaces measured $\frac{1}{50}$ in. by $\frac{1}{30}$ in. There was no evidence of dilatation of arteries,

extravasation of contents, of degeneration, decay, excavation, or erosion of nerve tissue. The epithelium of the central canal was well preserved, but the canal was small.

CASE 3. *Diabetes ; phthisis* (reported by Messrs. H. P. Welchman and J. K. Wormersley).—James C—, æt. 45, was admitted into Philip ward, under Dr. Mexon's care, on January 13th, 1876. He served twenty-three years in the American army, when he received a gunshot wound in the ankle, but otherwise was never invalided during the whole time. He has been accustomed to drink from half a pint to a pint and a half of whiskey per diem when he can get it. He has been a year in England dressing skins. Three months ago he caught cold, and a short hacking cough with viscid expectoration followed: he continued to work, but was feverish, excessively thirsty, and passed urine constantly during day and night. His appetite also became ravenous. On admission he was emaciated and haggard, with dry skin and flabby muscles. He had intense thirst and ravenous appetite. The heart sounds were feeble, the lungs and other viscera normal. The urine was pale, clear, acid, of sp. gr. 1032, free from albumen, but loaded with sugar.

For the first three days he had three pounds of meat, with bran biscuits, greens, celery, watercresses, and three ounces of brandy. On January 17th he was ordered to take milk alone. Of this he drank from seven to nine pints in the day, and generally was unable to get on without a little solid food, as fish or bran biscuit. Until the 25th the urine ranged between nine and thirteen pints daily, but after this it gradually fell to two pints, which was the quantity passed on February 16th.

Shortly after this he was transferred to Stephen ward, under Dr. Pavy's care; and on February 28th was ordered the ordinary diabetic diet, including one ounce of butter. On March 14th he was ordered five ounces of butter, and on April 8th two ounces of butter with four ounces of lactic acid. From this time cough became a prominent symptom, crepitation was observed at the right apex on May 1st, and with increasing physical signs of phthisis he died on June 11th. During April the urine diminished, so that in the latter half of the

month the daily amount was only thirty to forty ounces, and sugar was entirely absent from the 20th to the 27th. During May the quantity of urine was mostly less than two pints, but sugar was present in quantities varying from five to twenty grains per ounce.

The post-mortem was made ten hours after death.

The body was extremely emaciated. The right lung was extensively cavitated in its upper parts, the rest of the lung being tough and yellowish from infiltration with pneumonic products. The disease in the other lung was scattered and nodular. The brain weighed 53 oz. It looked quite healthy in all the sections—also the spinal cord, medulla, and pons.

Several sections of the *pons Varolii* were perfectly natural in appearance; several large vessels were exposed, especially as one approached the pit between the *crura cerebri*, and one lower down contained coagulated blood, but there was no reason to suppose it was anything but normal; its calibre was uniform, and it quite filled the space which it occupied. The posterior grey field was always quite natural. A section close down upon the *medulla oblongata* showed very well the aperture frequently observed in front of the facial nerve roots. It was $2\frac{1}{2}$ mm. by $1\frac{1}{2}$ mm., situate 5 mm. from the middle line, 5 mm. from the nearest point of the anterior surface, and 10 mm. from each of the anterior and posterior fissures. It was half filled with vessels and membrane, and was in communication with the exterior at the back of the olivary bodies; on the opposite side the section had fallen lower, and the aperture had been freely opened. In the median line were many vessels, as is usual in this situation. Other sections showed no appearance of disease whatever; the only thing noticeable being a rather large vessel, full of blood, in the grey matter of the floor of the fourth ventricle: it quite filled its space, and microscopically both it and the surrounding tissue were quite healthy.

Portions of the *spinal cord* showed here and there holes of $\frac{1}{150}$ to $\frac{1}{200}$ in. in the anterior cornua, and the commissural vessel spaces were of normal dimensions.

In the *corpus dentatum cerebelli* of one side the vessels were within the limits of health.

When examined with the microscope spots of "miliary degeneration" were found abundantly strewn throughout the whole nervous system. They were most numerous in the pons, which was literally stuffed with them. Besides these there was nothing morbid to be observed. The vessels in the cortex were mostly delicate, and nearly always filled the perivascular spaces; they often showed little yellowish unorganised masses on their walls, but there was no other evidence (even if this is) that the vessels had been in a morbid condition during life. In the floor of the fourth ventricle, at the level of the locus cæruleus, were found some vessels full of blood filling their spaces, one measuring $\frac{1}{80}$ in., another $\frac{1}{200}$ in. in diameter. The tissue about some of these veins was discoloured, but not unnatural in structure. In the cervical cord a central vessel space measured $\frac{1}{40}$ in. by $\frac{1}{70}$ in.

In the corpus dentatum of the cerebellum the largest vessel space was $\frac{1}{100}$ in. in diameter. The vessels of this size were some two or three in number, and one of these was decidedly thick. The thickening appeared to be due both in this and the other cases in which it has been noted to a swollen condition of the inner coats of the vessels, and not to any change in the outer coats.

CASE 4. *Diabetes; pneumonia* (reported by Messrs. W. Phelps and A. G. Barrs, M.B.).—Henry G—, æt. 20, was admitted into Stephen ward under Dr. Pavy's care, November 13th, 1874. He is a farm labourer and gives a good family history. He was quite well until six weeks ago, when he noticed that he drank much more than usual, and that he was getting weaker. He is of fair complexion, middle height, and weighs eight and a half stone. He has a large appetite; his bowels are confined, the tongue coated, and the skin dry. Heart and lungs normal. Temp. normal; pulse 80.

On November 15th he passed five pints eight ounces of urine, of sp. gr. 1038, and containing thirty grains of sugar to the ounce.

He was at first treated by restricted diet, and on December 11th one third of a grain of codeia was given three times a day. This was increased to half a grain on the 14th, to two

thirds on the 17th, to one grain on the 19th, and to one and a quarter grain on the 21st. On the 26th it was ordered to be increased one sixth grain every four days. During November the quantity of urine increased to twelve and thirteen pints in the twenty-four hours, but in December it fell again to four, five, and six pints. Towards the end of this month the sugar diminished and the urine was quite free from it when he left on January 4th, 1875.

He persevered with the restricted diet after leaving until August, when he considered himself so well that he discontinued it. His symptoms returned, and again in October, under medical advice, he recommenced dieting. In November he noticed cough, with expectoration of phlegm sometimes streaked with blood. He lost flesh and strength rapidly, and was admitted again under Dr. Pavy, on November 23rd, 1875. He weighed then eight stone two pounds, had a fairly good appetite, and drank much water.

The heart and lungs appeared normal. His urine was pale, of sp. gr. 1020, and contained much sugar. He was placed under the same treatment as before, and in the next month there was a decrease in the daily quantity of urine from eighteen to seven pints, and in the sugar, from 8000 to 1500 grains. However, on the 17th December physical signs of pneumonia were manifest at the left base, and these continuing he died comatose on January 3rd, 1876.

The post-mortem was made five hours after death.

The body was spare, but not wasted. The only lesions found were in the lungs. The right contained a large cavity at its apex, and much recent caseous pneumonia in patches. The left upper lobe was in a condition of diffuse caseous pneumonia not yet broken down, and in various other parts of the lung were other smaller but similarly diseased spots.

The brain weighed 46 oz., it was sliced in all directions and appeared healthy on all the sections. No wasting round any of the vessels could be detected by the naked eye, and no undue vascularity of any parts. The cord, medulla and pons, were all quite healthy in appearance.

The *cord* was thoroughly examined in the same manner as in the preceding cases; and there was nothing that could be regarded as morbid. It was noticeable, especially in the

lumbar region, that the vessels by the side of the central canal were large, and they occupied correspondingly large spaces, and sent correspondingly large vessels into the anterior cornua. It was easy also to make sections showing the connection of these large vessels with those in the anterior fissure.

The perivascular spaces by the side of the central canal were carefully examined with the microscope; but they were not found to differ in any respect from the normal, and were noticeable only on account of their large size. There was, however, no evidence to show that this was the result of disease; the contained vessels were perfectly natural. One space measured $\frac{1}{30}$ in. by $\frac{1}{80}$ in.; another measured $\frac{1}{50}$ in. by $\frac{1}{100}$ in., and contained a vessel of $\frac{1}{400}$ in. in diameter. In the lumbar region a vessel measuring $\frac{1}{200}$ in. in diameter was traced from the anterior fissure far into the cornu. This was, no doubt, a large vessel, but on the other hand its calibre was quite uniform, and its tissue absolutely normal.

CASE 5. *Diabetes; coma* (reported by Messrs. Winckworth and Stamp).—Harriet H—, æt. 47, was admitted into Clinical ward, on December 15th, 1874. She was first under the care of Dr. Wilks and subsequently under Dr. Pavy. She had enjoyed very good health, except that two years previously a tumour had been removed by Mr. Cooper Forster from the right breast. Three months before admission she began to suffer from intense thirst, a ravenous appetite, emaciation and polyuria, and latterly had had cough.

She was admitted in a somewhat emaciated condition, but without any visceral disease except saccharine urine. The quantity passed varied from three to four pints, sp. gr. 1015 to 1024, and it contained five and a half to eight and a half grains of sugar per ounce.

On December 21st a quarter of a grain of codeia was given three times a day. This was increased to half a grain on the 24th, and to three quarters of a grain on January 6th. By January 10th the urine contained but a trace of sugar, and after that date it contained none. The codeia was discontinued on the 11th. She left the hospital well on February 13th, having gained flesh and being in good spirits.

She was readmitted on December 16th of the same year, when she stated that till a month or six weeks ago she had remained well, but keeping on the restricted diet all that time. For the last six weeks, induced she thinks by a damp climate, she has had a bad cough, and has rapidly emaciated. Latterly, the thirst has returned. She was extremely emaciated, spoke in a drowsy manner, and complained of much pain in the left chest. The urine contained much sugar. She gradually became quite comatose and in this condition transfusion of a saline fluid was adopted¹ (3j of salt to a pint of water). This gave no relief and she soon died.

The post-mortem was made five hours after death.

The body was very emaciated. The bases of the lungs contained pneumonic patches, and the left base was in a state of gangrene.

The liver was dark coloured and somewhat tough. The kidneys yellowish, their cortex thin; the epithelium very fatty. The bladder not hypertrophied.

The blood was black in colour, and the whole body had a very peculiar mousy odour. The blood-corpuscles were not altered microscopically.

The brain and its membranes were quite healthy. The brain was somewhat firm. It was not wasted, nor was any marked evidence present of wasting round the vessels, though it was searched for carefully in all directions. The pons and medulla were quite healthy. The spinal cord was remarkably small, not larger than is usual in quite young people; its substance firm. The vessels in the anterior cornua distinct (? large), and very little grey matter was to be seen. There was considerable lateral spinal curvature.

On examination after hardening, nothing unusual was visible in the structure of the parts. The *pons* showed, as usual, vessels of fair size in the median line and in the outer portions. The facial holes were in this case not more than mere clefts, the sections of the pons having been made lower than usual. Some rather large vessels were found in the corpora quadrigemina, but all filled their spaces; and they had no abnormal appearance about them except that some were dotted with a few orange-coloured granules.

¹ See footnote, p. 420.

Sections of the *medulla* showed vessels of rather large size, especially those running with the root fibres of the hypoglossal and vagus nerves, and those in the median line. Spots of "miliary degeneration" existed in small quantity in several sections of the spinal cord: many were to be seen outside the section, resembling round globules of fluid.

In the *spinal cord* the spaces for the central vessels were moderately large, but not so large as those in the case of Henry G— (No. 4). One can only repeat here what has been said of the other cases. The parts were normal, and there was no evidence either in vessels or nerve tissue of the various morbid conditions mentioned by Dr. Dickinson. The *crura cerebri*, pons, medulla, and cord were examined throughout.

CASE 6. *Diabetes; phthisis* (reported by Mr. W. A. Kidd, M.B.).—Edward W—, æt. 32, was admitted into Clinical ward under Dr. Pavy's care, February 9th, 1876. He has been fairly healthy, with the exception of a cough, during the winter time, accompanied by expectoration, but without hæmoptysis or night sweats. His present illness began four months ago with pain in the epigastrium, unnatural frequency of micturition, and increased thirst and appetite. His bowels have been constipated, he has lost flesh, and his cough has been troublesome at nights, the expectoration being frothy and slate-coloured. His legs have swollen on two or three occasions, and he has done no work since the middle of December.

On admission he is wasted and exhausted, with harsh dry skin and pale face. There is œdema of the ankles, eyelids, and conjunctivæ, and the fingers are clubbed. The chest is deep and narrow, and does not expand well at the apices. Percussion resonance is nearly tympanitic everywhere except over the upper lobes posteriorly. Breath sounds are harsh, in some parts almost bronchial; expiration is prolonged, and mucous râles are heard occasionally when he coughs. Vocal resonance is not increased. The sputa are abundant, greenish, muco-purulent.

The heart's impulse is faint, its area of dulness normal, the sounds distinct. The urine is acid, of sp. gr. 1018, con.

tains a small quantity of albumen, but no sugar. Temp. 99.2° ; pulse 100; resp. 28.

He was ordered iron and cinchonine and full diet, with port wine and milk.

On February 12th the urine contained sugar, but no albumen. On the 17th he was ordered a grain each of digitalis and opium, with half a grain of digitalis every six hours.

On February 18th urine measured four pints seventeen ounces, and contained forty-eight grains of sugar to the ounce. After this the quantity of urine was, except on two occasions, scarcely above the normal, and the amount of sugar per ounce fell to twelve, nine, and seven grains. The physical signs of phthisis became rapidly more and more marked and extensive, and he died on March 6th, one month after admission. The urine two days before his death measured two pints two ounces, had a sp. gr. of 1022, and contained twelve grains of sugar to the ounce.

The post-mortem was made thirteen hours after death.

The body was emaciated. There was some little recent pleurisy, and both lungs were in a state of caseous pneumonia. The apices were extensively affected and converted into large ragged cavities. The right side of the larynx showed a deep ulcer just in front of the arytenoid cartilage. The liver was dark and homogeneous in appearance, so far like a diabetic liver. The gall bladder contained normal bile. The kidneys weighed 13 oz.; they were rather coarse, but healthy. The brain weighed 46 oz.; it was quite healthy; no large vessels could be seen in any abnormal spot, neither were there any spaces visible to the naked eye round the vessels: the cord was also quite healthy.

Dr. Pavy thought that in this case there might possibly be enlarged bronchial or mediastinal glands pressing upon some of the splanchnic nerves and thus causing the diabetes by implication of the branches of the abdominal sympathetic. At the post-mortem, however, the glandular structures in the thorax called for no remarks. After hardening, the only points noticeable in the *pons* and *medulla* were an aperture in front of the facial nerve root, similar to those described in preceding cases, and some well-marked vessel channels in the course

of the sixth and seventh nerve-roots as they leave the grey matter of the fourth ventricle, besides others in the median raphé. These were all uniform in diameter and not unnaturally large. Elsewhere these parts as well as the *spinal cord*, at least in its cervical and lumbar regions, were natural. The dorsal portion was not well hardened, and little can be said of it.

Microscopically examined the medulla and cord proved to be perfectly normal. Many large vessels full of blood were observed in the usual situations; one had some yellowish crystalline-looking bodies on its walls. They all filled or nearly filled their spaces, and there was no trace of any disintegration or even granular change in the nervous structure around.

CASE 7. *Diabetes* (reported by Mr. J. Todd).—Ebenezer F—, æt. 31, was admitted into Clinical ward, under Dr. Fagge's care, on August 2nd, 1876. He had always enjoyed good health until two years previously, when he first noticed that his mouth was dry, and that he passed great quantities of urine. Subsequently he became very weak, and suffered from coldness and pain in the extremities, back, and loins; at the same time he lost flesh, though his appetite and thirst were very great. More recently he has suffered from diarrhœa, and the last three weeks he has noticed a slight cough with night sweats and increasing emaciation. He has been under no treatment at all.

On admission he is emaciated and feeble, with flushed cheeks and bright eyes. The tongue is clean, the gums spongy, the bowels open, but not relaxed. On the right side of the chest from the apex to the third rib there is dulness, with fine muco-crepitation, bronchial breathing, and bronchophony. At the left apex there is slight dulness with very little crepitation. The heart is normal, and the liver and spleen dulness natural in extent. The urine is light-coloured, of sp. gr. 1032, and contains thirty-six grains of sugar to the ounce. Temp. 101.4°; pulse 120; resp. 32.

He was ordered Ol. Morrhuæ, ℥ss t. d., Mist. Cinchoninæ, ℥j bis die, and his diet was restricted to a chop, greens, toast, and four ounces of brandy.

During the next fortnight he passed daily from two to three

pints of urine containing from thirty-five to forty-five grains of sugar per ounce.

On the 9th he was ordered half a grain of codeia three times a day.

On the 14th he was drowsy, and continued to be so until the 18th, when whilst sitting in a chair he appeared to have been taken with serious symptoms; he was moved into bed and died in a few minutes.

Post-mortem examination.—The brain and cord were removed for us without being cut. The lungs showed old chronic phthisis with fibrous change; the intestines a little subserous tubercle and at one spot an ulcer.

After hardening, the portions of *brain* and *cerebellum* reserved appeared perfectly natural, as well as the greater part of the *pons*. In the lower part, however, successive sections brought out a cavity 4 mm. in diameter, and bounded anteriorly by the anterior transverse fibres of the *pons*, and on either side by the descending fibres; it was full of gelatinous material, obviously vessels, which were in connection with the pia mater on the anterior surface of the medulla.

The medulla oblongata was quite natural, as well as the spinal cord in its whole length. Indeed, the vessel-spaces were here unusually small, much more so than in the previously described cases.

Unfortunately the cord was hardened badly, and the microscopic examination was incomplete; the cortex cerebri proved to be normal.

CASE 8. *Diabetes* (reported by Mr. A. Smart).—Lucy K—, æt. 25, a housemaid, was admitted into Addison Ward, under Dr. Pavy's care, on March 1st, 1876. Her parents had both died of bronchitis at an advanced age, and her brothers and sisters were healthy. She herself has never been laid up until twelve months ago, when she was frightened by the report of a pistol in the house where she was in service. Since that time she has suffered from leucorrhœa, has felt ill, and has lost more than a stone in weight.

On admission, she is well made, with bright red complexion, and a yellow tinge round the eyes and lips. The skin is

warm, moist, and perspiring. The tongue is moist and red, and the bowels regular. The lungs and heart are normal. She complains of no pain, but has great thirst. She passes in the twenty-four hours eight pints of pale urine containing sugar. Temp. 98.2° ; pulse 96; resp. 30.

During the next few days the daily quantity of urine fell to three and three quarters pints, but it again rose to six and seven pints.

On March 27th she was about the ward, feeling very well; the bowels regular; the pulse and temperature normal.

During the next three weeks the urine varied from three and a half to six pints in amount, being mostly between four and five pints.

She was ordered one third of a grain of codeia, with nuxvomica and gentian three times a day. She remained fairly well till May 4th, when she ailed a little and said she had taken cold.

On the 6th a pleuritic rub was heard at the base of the right lung. She was very restless and strange in the head. Her breathing became more impeded and she died suddenly the next morning at 7.30 a.m.

Post-mortem examination eight hours after death.

The body that of a fairly nourished woman.

The blood had a peculiar mousy smell, not unfrequent in diabetes after death. Its colour and coagulability presented no alterations.

Both lungs were œdematous, and the right middle lobe in a state of acute pneumonia. It was not gangrenous.

The liver weighed 80 oz., its appearance was homogeneous. The kidneys weighed 14 oz. The bladder was a little dilated.

The brain weighed 50 oz. It was very firm, but normal in appearance everywhere. The places described by Dr. Dickinson as showing changes in diabetes were examined carefully, but without detecting any holes round any of the vessels, or indeed any vessels of large size in abnormal situations. The medulla, pons, and cord were all quite healthy, but looked rather full of blood.

Sections of the *pons* showed the apertures which have been noticed in other cases, namely, a central cavity at the upper

part of the pons, and at the lower part, one on either side, in front of the root fibres of the facial nerve. The former contained gelatinous material, of which a section was made for examination. A section on one side of the part, where the optic thalamus is merged in the crus cerebri, showed a cribriform appearance, but it was close to the surface, and numerous vessels came in from the velum interpositum; they appeared to fill the spaces well. The vessels situate within the capsule of the corpus dentatum of the *cerebellum* were numerous, and contained blood. In one portion of the *spinal cord* there was a ragged cavity in the grey matter, which appeared to be the result of incomplete action of the chromic acid; it was not in connection with any vessel. The cord was elsewhere healthy.

Under the microscope the vessels in the corpus dentatum cerebelli appeared perfectly natural; they often contained blood, but quite filled their spaces, and there was no evidence of decay of the surrounding tissues, nor of hæmorrhage into them. The largest space measured $\frac{1}{25}$ in. by $\frac{1}{50}$ in. The medulla and cord were normal.

CASE 9. *Diabetes* (reported by Mr. R. A. Ross).—Alfred B—, æt. 22, was admitted into Philip ward under Dr. Moxon, December 13th, 1876. He gave a good family history: he was married, and had four children. He was quite well until three years ago, when he found himself getting weak and losing flesh without apparent cause, and he did not at the time observe that he passed more water than normal. A year ago he was much benefited by a stay of six weeks in the hospital under Dr. Wilks. The last four or five months he has become very weak, and has been treated by restricted diet.

On admission, he is much emaciated, complains of great debility and thirst. The appetite is voracious, the bowels constipated, the tongue clean and raw. The area of præcordial dulness is slightly diminished, otherwise the heart is normal: the right apex is less resonant than the left, which is perhaps hyper-resonant: the expiratory murmur is prolonged on the right side. The urine has a pale straw colour, and a specific gravity of 1030. He has passed seven pints in the twenty-four hours, and it is loaded with sugar,

He was at first put on full diet, but on the 19th this was changed for milk diet. On the 20th he complained of severe headache, and on the 23rd was drowsy and extremely feeble. From this date he gradually sank, and died without coma on the morning of the 26th. The analysis of his urine gave the following results :

Date.	Quantity.	Specific gravity.	Daily quantity of sugar.
December 16th .	8 pints 6 ounces	... 1034	... 7968 grains.
„ 17th .	10 „ 2 „	... 1025	... 8888 „
„ 18th .	10 „ 7 „	... 1032	... 9936 „
„ 19th .	10 „ 3 „	... 1035	... 9947 „
„ 20th .	7 „ 9 „	... 1026	... 4917 „
„ 21st .	5 „ 7 „	... 1030	... 3852 „
„ 22nd .	5 „ 7 „	... 1030	... 3745 „
„ 23rd .	5 „ 6 „	... 1035	... 2440 „
„ 24th .	5 „ 4 „	... —	... —
„ 25th .	4 „ 12 „	... 1026	... 1018 „

Within eight hours after death the brain and spinal cord were removed, but the other viscera were not examined. The blood-vessels of the membranes were full: the brain was firm, the convolutions distinct, and rather narrow. The *puncta cruenta* did not appear so numerous as usual; a few minute holes were visible in and near the cortical grey matter. In the white matter of the corpus dentatum cerebelli were numerous rather large vessels containing fluid or recently clotted black blood: in no section of the brain were holes of unnatural size observed. The spinal cord after twenty-four hours' immersion in spirit appeared perfectly healthy on section, without any visible aperture, enlarged vessels, or indistinctness of the markings.

On naked-eye examination after hardening the vessels of the *spinal cord* were in all three regions larger than usual: they were largest in the cervical and least in the dorsal region.

In the *medulla oblongata*, at its lower part, many vessels were visible, especially in the situations where they are usually large, viz., the median raphé and the olivary bodies, and there were a few in the grey matter of the floor of the fourth ventricle. In the upper medulla it was not difficult to find the apertures at the roots of the facial nerves; they were no bigger than those found in the first case (Case 1). On opening up

the intercrural pit in the *pons* there was no indication of disease in the surrounding tissue. The upper part of the *pons* and the *corpora quadrigemina* were perfectly healthy. The corpus dentatum of the *cerebellum* showed the vessels which have been previously mentioned.

Sections from the spinal cord, medulla oblongata, *pons*, corpus striatum, convolutions of the cerebrum and corpus dentatum cerebelli were examined under the microscope. The spinal cord differed somewhat from the usual standard: the vessels were thick-walled, though not large, and the bands of connective-tissue forming septa in the white columns were unusually thick. In other respects there was nothing worthy of notice: the commissural vessel-spaces were not exceptionally large; the central canal was choked as usual with epithelium. In the medulla and the *cerebellum* many vessels contained blood, and both here and elsewhere through the brain were found vessels with the surrounding perivascular tissue studded with yellow and orange glistening masses. Only occasionally was any vessel seen which was sufficiently irregular in diameter to suggest dilatation; the perivascular spaces were not anywhere disproportionately large. The two largest vessels in the corpus dentatum measured respectively $\frac{1}{60}$ in. and $\frac{1}{50}$ in. in diameter. Sections through the *corpora striata* and *corpora quadrigemina* appeared perfectly normal.

We have been thus detailed because it might otherwise be suspected that our examinations had been made neither with sufficient care nor with an accurate knowledge of what was to be sought. In summarising the results of our researches, it will be convenient to deal *seriatim* with the changes which Dr. Dickinson has described, and thus ensure due consideration being given to every point in his case.

Dilatation of the blood-vessels.—In no one out of a large number of specimens did we see any condition of the arteries that could with certainty be regarded as morbid dilatation. The vessels were mostly, as usual, patent; and wherever the section allowed them to be traced for any distance, they were found to be of uniform calibre, or decreasing in proportion to the size of the vessels given off. Their actual size varied in

different cases; and in No. 4 especially the vessels appeared to be much larger than those of the other cases in similar situations. But arteries are naturally as variable in calibre as men in height and weight, and none of these reached a size that could be looked upon as the result of disease.

Vessels filled with blood-corpuscles were seen in about one half the cases, the situations most frequently occupied being the grey matter of the floor of the fourth ventricle, the median plane of the medulla, and the corpus dentatum of the cerebellum. We should not have noted the fact as of any importance had not Dr. Dickinson included accumulation of contents amongst the morbid alterations he described, since there is no evidence that what we saw was anything more than the result of post-mortem coagulation. Nor have we seen any vessel containing "altered coagulum," as described by Dr. Dickinson (*loc. cit.*, p. 257), except such as may have been changed by the processes of hardening and clearing.

With regard to *extravasation of contents* we have never seen actual hæmorrhage, or the escape of blood-corpuscles described in Dr. Dickinson's seventh case, and figured in his later monograph (page 34). Where large vessels were filled with blood the nerve tissues around were sometimes discoloured—a condition to be ascribed to decomposition and escape of colouring matter post-mortem. Rarely we saw a few faintly yellow, scarcely crystalline, and yet not organized, masses in the space outside the vessels, which, with the tissues in the neighbourhood, were quite healthy. We do not feel satisfied that they were hæmatoidin. In the last case only did we find glistening bodies more closely resembling hæmatoidin, distributed pretty generally about the vessels of the brain, pons and medulla. They were orange-coloured, of varying tint and dotted over the tissues in the neighbourhood of vessels, mostly entangled in a loose connective tissue which occupies the perivascular space. Under a high power they were never crystalline in shape, though they might have been square, hexagonal, or octagonal crystals with their corners wanting. They were peculiarly glassy looking, and in this respect rather crystal-like, but the same appearance is not uncommon in corpuscles that have been allowed to dry. Similar appearances may be seen occasionally in the viscera after various

hardening processes, and it may well be doubted if they have any pathological importance. It is, however, but fair to say that we have found the same bodies present in quantity outside the small cerebral arteries in cases of softening of the brain; but this again may mean no more than that certain parts in the brain contained a larger supply of blood than usual at the time of death.

In no case did we discover any condition of the *perivascular spaces* that was distinctly pathological. In by far the greater number of observations the vessel lay in a space about twice its diameter; occasionally the proportion of space to vessel has been larger, often on the other hand smaller. Any decided proliferation of nuclei was only seen here and there in one case.

Degeneration of nervous tissue.—With regard to this change, we have utterly failed to find anything different from what may be seen in the nervous systems of persons not suffering from diabetes and in those dying by accident. Three cases presented the round and oval transparent bodies, which have been so often found by various observers, and which are known to have no special relation to any one disease of the nervous system. Dr. Dickinson noticed them in only one of all his cases; and though he describes the condition in full, and gives drawings of the appearances, he does not claim it as peculiar to diabetes.¹ No other changes were found that could be attributed to the degeneration of

¹ This is a sufficient reason for not going further into the nature of this change at present. Indeed, had it been necessary to do so we doubt whether, even with the information which has of late been furnished by various observers, we yet possess any adequate knowledge of the material itself, of its meaning when we find it, or of what diseases it is an indication. Its relationship to other morbid changes has also yet to be worked out, and the distinction between colloid degeneration and miliary sclerosis or degeneration must be more clearly defined before we can discuss to any certain purpose either the one or the other. At present these two conditions seem so much allied that we have thought it better, in order to avoid any misapplication of terms already in use, to refer some of our specimens to Mr. W. Henry Kesteven and Dr. Batty Tuke, both of whom have written on nerve-degeneration. They were kind enough to examine them for us; and the bodies were described by Dr. Tuke as miliary sclerosis, by Mr. Kesteven as miliary degeneration. Of the two we think the latter term is preferable, since there seems no good ground for considering the change as one of sclerosis as that word is usually understood.

nervous tissue, though special examination was made of those regions of the pons, medulla and cord which were said to be excavated or eroded in Dr. Dickinson's cases. To take first the spinal cord, there was the greatest variety in the size of the spaces which normally exist on either side of the central canal, and receive blood-vessels from the anterior fissure, in order to transmit them to the anterior cornua and other parts; in some cases it is true they were large, but there was nothing to show that their size was due to morbid disintegration of nerve tissue. The vessels presented the usual relations to the spaces, and were, as we have before said, themselves normal. Even if great size be regarded as abnormal, it was not a constant change; in some of our cases these spaces were insignificant. In the pons and medulla were to be found apertures in the situations Dr. Dickinson has mentioned; but they were so obviously the continuation of natural depressions, and so manifestly presented healthy structures, both in their contents and surroundings, that it could not be for a moment supposed that they had any connection with the diabetes. In only a few of our cases was the brain examined microscopically throughout; in some a few portions of the cortex were preserved, in others the corpus striatum and optic thalamus, and in those parts we did not find any cribriform alteration or degeneration. It is open to any one to object that, had we looked further, we might have found more; but in so far as the optic thalami and corpora striata are concerned, the persistence of healthy conditions in even two cases is sufficient to show that diabetes may be independent of disease in these bodies; while the fact that in those portions of the convolutions and cerebral white matter which we examined no cribriform degeneration could be found, is in opposition to what is implied in Dr. Dickinson's summary.

The *central canal of the spinal cord* was never enlarged: in one case the epithelium was unusually well shown; in the other eight the canal was represented, as is mostly the case in our experience in healthy cords, by a mass of epithelial cells and nuclei, in which no aperture or "lumen" could be detected. The condition is no doubt due to post-mortem alteration, probably from mechanical causes.

Finally, we may say that we have found *no constant change* associated with diabetes in the nine cases we have examined. The most considerable deviations from the usual standard have been—the presence of glistening bodies of orange-red colour (hæmatoidin?) about the vessels in one case; large size of vessels in one; rather thick-walled vessels, and thick connective tissue septa in the cords of about half.

But it will be seen that we describe apertures in the pons, medulla, and spinal cord, situated at the same points as those on which Dr. Dickinson has laid so much stress; and it may be said that we have here found the same lesions, and that our results are really confirmatory of his. But though the appearances are similar, and the conditions probably the same, we cannot regard them in the same light as he does; and with all the respect due to Dr. Dickinson's high standing as a clinical physician and pathological observer, we venture to think that he has described as morbid conditions of the nervous system which are nothing more than perfectly normal. The more carefully we peruse the works to which we have already so often alluded the more suspicious do the descriptions contained therein become. The hyper-critical examination to which the anatomy of the nervous centres has been subjected will be manifest to any one who reads the passages on pp. 246, 247, which contain an account of the spinal cord in the fourth case. Dr. Dickinson there speaks of dilatation of the vessels in the anterior fissure and in the anterior horns, and says that in the latter situation the tissue in contact with their walls was "uneven and tattered." But this is a condition commonly enough seen; the vessels naturally run in mere channels, and the tissue is of such a consistence as easily to suffer from the razor when the sections are thin. Again, he says, "The commissure contained one, in some cases two, perforations, through which vessels passed, a considerable interval existing between the vessel and the broken nervous matter which bounded the space." This appears to us a very good description of the normal condition of the parts if one reads "apparently broken" for "broken." There is nothing but this last word which indicates that a diseased state is being spoken of. On either side of the central canal there is

naturally a vessel or series of vessels running vertically, given offshoots into the cord. These commissural vessels, as they may be called, are in communication with those in the anterior fissure, whence of course they receive their blood; and it is not difficult in making sections to hit upon the point at which the vessel is passing horizontally, or nearly so, from the pia mater to the commissural vessel canal. Naturally the nerve tissue must make way for it, and hence may arise appearances to which the terms "erosion," "excavation," "excoriation," are for descriptive purposes more or less applicable. What grounds has Dr. Dickinson for regarding these holes as morbid? "The course of the vessel was fringed with detached and irregular ends of nerve-fibres." "The bottom of the anterior fissure was eroded and filled with the products of disintegration." "In some cases the excavations besides vascular structure contained the remains of areolar and nervous tissue." The first appearance might easily be produced in the way we have suggested, while with regard to the products of disintegration and remains of nervous tissue, in the absence of granular corpuscles we do not know what would be regarded as especially the result of nervous and what of areolar disintegration. Moreover, with few exceptions, Dr. Dickinson grants that the nerve matter round these apertures was natural, and his figures, too deeply shaded as they are to be distinct, are not opposed to such a view. Then, if the size of these commissural vessel spaces be inquired into, it is found that they looked to the naked eye like the prick of a needle—a measurement which, if not indefinite, is quite within the limits of health.

On this point we might, indeed, appeal to a far larger experience than our own, for if it be true, as Dr. Dickinson states, that "cavities were thus produced often large enough to be striking objects even without the microscope," it is to say the least remarkable that no one has insisted on such appearances hitherto. For there can, we think, be no doubt that though thorough microscopical examinations of the nervous structures in diabetes were wanting prior to Dr. Dickinson's, a careful examination by the naked eye has been made in nearly all cases. Pathologists have always been alive to the possibility of the nervous origin of diabetes, and that but few or no recorded histological observations are to be found is

surely because the naked-eye appearances gave no indication whatever that such a line of investigation would prove remunerative. We can say so much, indeed, within our own knowledge.

We may next consider the apertures which were found in the pons Varolii, in the middle line, and at the roots of the facial nerves, which Dr. Dickinson himself recognises as in connection with processes of pia mater, contained in fissures naturally existing. We would, however, regard rather as pits than fissures the deep depressions naturally existing in the following situations. One, remarkably deep, passes downwards and backwards between the crura cerebri, and behind the upper transverse fibres of the pons deeply into its substance; this lodges a considerable bundle of vessels, supported by pia mater, and fixed firmly by the numerous large branches, which enter the nerve substance. On cutting sections of the pons from below, this depression may be opened up at a point fully one third of an inch from the anterior margin of the pons, and hence apparently quite in its substance. A second smaller depression runs upwards in the middle line between the anterior pyramids and behind the lowest transverse fibres of the pons; and others exist at the same level, one on each side, running from behind the olivary bodies far up under the transverse fibres, and close in front of the root fibres of the portio dura. With care these depressions can all be cut across so as to represent apertures containing gelatinous material, that is, vessels and areolar (pia mater) tissue. We found them, as has been seen, in our cases of diabetes, and we have found them in health; and we fail to see what evidence there is that they were eroded or excavated in Dr. Dickinson's cases. The gelatinous contents in his second case (p. 242), proved to consist of vessels, parallel, tortuous, or entangled, imbedded in a "translucent substance, which from the delicate parallel lines it displayed, was supposed to be an altered condition of fibrous nerve tissue," and further, "the edges of the spaces were fringed with broken vessels and nerve-fibres." We would here ask, in the absence of anything in the accompanying plate sufficiently definite to ground an opinion on, whether the delicate parallel lines could not have resulted as well from connective tissue as from nerve tissue? while the suggestion that

broken blood-vessels of the size represented could have existed in the man's pons without giving rise to quickly fatal hæmorrhage, only needs to be considered for a moment to be rejected. Not that we think the drawing unfaithful, but that in the description it is assumed and implied that the discontinuity of the vessels was due to rupture by disease. For if not, in what does the lesion consist? healthy vessels may break or be cut across post mortem; and there is no other condition described or figured that proves them to be the subjects of morbid alterations. The apertures found in other cases seem to us open to similar criticisms.

We now turn to another lesion which Dr. Dickinson describes in a few of his cases—the cribriform state of the brain-matter; and we are inclined to think that even this apparently striking condition is not so far removed from health as to justify its being regarded as an “initial fact” in diabetes. The spaces are allowed to be perivascular, and it comes to be simply a matter of observation as to the circumstances under which an unusual size of these channels may be observed. Durand-Fardel¹ has already described the “état criblé” of the brain, and it is not clear that the changes found by Dr. Dickinson are at all different. The condition was found by Durand-Fardel in old people, and was regarded by him as the result of chronic congestion of the cerebral vessels. We have examined the brains of persons not affected with diabetes, and have found that the convolutions of the island of Reil and its neighbourhood show a great number of apertures in the white matter; and in one brain, that of a man, aged sixty-five, who died of an injury received three weeks previously, horizontal sections through the lenticular nucleus and island of Reil, revealed in the white matter outside the claustrum (nucleus tæniiformis) a number of closely set holes, many of which were as much as $\frac{1}{70}$ inch in diameter, while others measured $\frac{1}{100}$ inch, and the corresponding convolution in the opposite side was precisely similar. No other portion of the brain showed so cribriform a state, but a considerable display of pinpoint holes could be obtained by making a tangential section of the hemisphere just below the grey matter.

The condition of the island of Reil appears to have closely

¹ ‘*Maladies des Veillards*,’ Paris, 1854.

resembled what was found in the cerebral convolutions in Dr. Dickinson's case (Sarah Stewart, Case 4, plate viii, figs. 7 and 8. The largest hole in fig. 7 measures $\frac{1}{50}$ inch, and most of them are much smaller.) Considering, then, that this cribriform condition has been specially described as a characteristic of advanced age, that we have ourselves seen it in individuals not suffering from diabetes, and that out of ten cases recorded by Dr. Dickinson, only three, one of which was in a man aged seventy-one, presented it in both white matter and central ganglia, and three others in the central ganglia alone,¹ we think we may fairly hesitate to accept the condition as intimately connected with the causation of diabetes.

In conclusion, we may say that we are not alone in our unwillingness to endorse Dr. Dickinson's account of the morbid anatomy of diabetes, as will be shown by the following references, met with when our material was already collected and the paper sketched out. Drs. Wilks and Moxon,² after alluding to Dr. Dickinson's observations, write thus: "We have searched several cases, without discovering more degeneration than belongs to wasting diseases. Since the discovery of artificial diabetes by wounding the floor of the fourth ventricle this part has been especially examined, but there are not more than three or four instances of diabetes from obvious diseases there, &c."

E. Külz³ examined the medulla oblongata in three fatal cases with especial reference to Dr. Dickinson's observations, and was unable to demonstrate in any case enlargement of the perivascular spaces. W. Müller,⁴ of Jena, also found the perivascular spaces no larger in diabetics than in those dying from other complaints; and he adds, "Die ganz unglaubliche Angabe Dickinson's, nach welcher der vordere Längsspalt des Rückenmarks in mehreren seiner Fälle ex-

¹ The first three are Stewart, Hudson, and Kirby; the others are Passenger, Rock, and Mackay. In his 'Monograph,' 1875, p. 33, Dr. Dickinson says he has examined the nervous system in *eleven* cases, but he records only seven in the 'Med. Chir. Trans.,' and three in the later work, pp. 145 to 176.

² 'Path. Anat.,' pp. 636, 637.

³ 'Beiträge zur Path. u. Therap. des Diabetes mellitus,' Marburg, 1874.

⁴ 'Beiträge zur Pathol. Anat. des Rückenmarks,' Leipzig, 1871; 'Dritte Beobachtung,' p. 41.

koriirt gewesen sei, mit Blosslegung der Nervenfasern (ohne dass eitrige Leptomeningitis oder Granulationsgewebe vorhanden gewesen wäre), sowie seine von ungenügender Kenntniss der normalen Verhältnisse zeugenden Angaben über das Verhalten der Oberflächen der Pons, lasse ich auf sich beruhen."

Here then we must leave the matter. The observations which we have recorded will at least show that a pathological state of the nervous centres in diabetes cannot as yet be considered to be proved. The questions embraced are still open for further work; for, while we dissent from some of the conditions which Dr. Dickinson would associate with diabetes, and from the interpretation which he puts upon the others, we do not say that there is *no* nerve lesion in diabetes. We have not found any; nor do we think that hereafter other observers will confirm, any more than we have done, any such general pathological state as is described in the papers we have, we hope with all courtesy, criticised. It hardly needs remark that disease in the central nervous centres may be capable of producing profound functional disturbance of this or that organ, and at the same time occupy so small a portion as at present to have eluded detection. Such a change may perhaps still be forthcoming; and whether Dr. Dickinson has interpreted his observations correctly or not, his papers must still, as they have already done, prove valuable as an instalment of work in a field hitherto not sufficiently explored.

ACUTE POISONING BY PHOSPHORUS.

BY THOMAS STEVENSON, M.D.

CASES of poisoning by phosphorus, though common enough on the Continent, are sufficiently rare in this country to render interesting the following histories of three fatal cases of poisoning by that potent element.

The pathological results of phosphorus poisoning appear to be by no means well known among the generality of medical men, who, as a rule, are but little acquainted with the insidious symptoms preceding the fatal event.

For notes on the first case here related I am indebted to Messrs. T. R. Judson and W. J. Tyson, whose observations are, however, supplemented from my own personal observation of the girl. Mr. Judson has given me a verbal history of the second case. Mr. W. Joseph Tyson, in whose practice it occurred, has also furnished me with notes on the third case.

Those who are interested in the subject may find records of previous cases, one of which was in Guy's Hospital, in the 'Medico-Chirurgical Transactions,' vol. lx, pp. 87, 89.

Sarah B—, æt. 5, was admitted into Clinical Ward, under Dr. F. Taylor, on July 22nd, 1876, with the following history:—About 1 p.m. on the previous day she drank some "phosphorus paste" which had been mixed with warm water in a teacup by her mother for a suicidal purpose. The mother drank of it, and on the child asking for some, she

gave it to her. No poisonous symptoms appeared for some time, for the child went to school later in the day as usual, and in the evening complained of "stomach ache" only.

On the morning following (22nd) about 7 o'clock she was sick, vomiting some "slimy" fluid, and the mother noticed that the child's "breath smelt like the empty jar." The child was sent up to Guy's Hospital at 9 a.m., and an emetic was administered in the surgery, which acted freely; the vomit was unfortunately thrown away.

When admitted into Clinical ward at 10.30 a.m. the patient was in a state of semi-collapse. Resp. 28, quiet; pulse 140, small, feeble, and regular; temp. 99.5° . Heart sounds normal. Pupils dilated, equally respondent to light. The breath smelt slightly, as was supposed of sulphur. No jaundice. Bowels not acting. Ordered milk, and two ounces of brandy.

About 2 p.m. a small jar which had contained and still smelt of phosphorus paste, was brought to me with the statement that the girl had taken out of it some stuff, which was supposed to be a preparation of sulphur. I at once perceived the gravity of the case, and as the girl had not yet been seen by Dr. Taylor, and there was nothing in her more obvious symptoms to excite alarm, I cautioned the clerk in charge to keep her closely watched, since her present condition, though not apparently alarming, was quite consistent with a fatal termination. The only striking thing at that time was that she appeared to be drowsy, had a dark areola round the eyes, and the pulse was feeble. She took some milk, but vomited it directly.

6.30 p.m.—Again sick.

9 p.m.—Has been asleep most of the evening, is now thirsty and asks for drink. Temp. 98° ; pulse 128, small; resp. 28, tranquil. Does not complain of pain. The following has been ordered:

℞ Pulv. Magnes. Carb., gr. xv.
Pulv. Tragac. Co., gr. x.
Aquæ, ℥j. 4tis horis.

23rd.—Restless and drowsy during the night. Took milk freely, but vomited it almost directly; kept the medicine down. Bowels not open.

10.50 a.m.—Temp. 97.7° ; pulse 132, small, thready; resp. 26, grunting. Thirsty, restless, and very dark round the eyes.

7 p.m.—Has been less restless, but constantly sick.

R Mist. Magn. et Magn. Sulph. ʒss.
Statim et rep. idem 4tis horis, si opus sit.

One dose acted freely. Soon after 7 p.m. she became very restless and delirious, called out for her mother, and tried to get out of bed. She passed her urine and fæces under her. No jaundice. The patient died at midnight, fifty-nine hours after taking the poison, having been convulsed just before death, the fingers being firmly flexed and the legs drawn up.

Post-mortem, made fifteen hours after death.—No ecchymosed patches on the skin.

Brain congested, healthy, weighing 38 oz.

Heart weighed 3 oz. Several small patches of ecchymosis on the posterior part of the right side. Muscular walls of normal thickness, but greatly affected with fatty degeneration, which was most marked in the left ventricle. Valves healthy. On the external surface of the arch of the aorta near its origin there was an ecchymosed patch.

Stomach contents thick, pulpy, like half-digested food; no smell of phosphorus. Surface of mucous membrane thickly coated with tenacious mucus, which was with difficulty scraped off. The mucous membrane was considerably injected along the lesser curvature and the anterior and posterior surfaces. No abrasion or ulceration.

Intestine small, much congested, especially at the upper part.

Liver weighed 26 oz.; it was very yellow, and presented all the characteristics of an extremely fatty organ. The surface was for the most part injected, but here and there this condition was absent; and then the yellow colour contrasted strongly with the bright red of injection. On section the yellow colour was well marked, the appearance of lobules being to a great extent lost. The liver tissue burnt readily in a spirit lamp, but did not float in water. The tissue was itself anæmic.

Kidneys weighed $4\frac{1}{2}$ oz., healthy, but somewhat congested.

The liver and other degenerated viscera were placed in jars to await the coroner's inquisition. The weather was exceedingly hot, and the decomposition was too speedy to admit of any hope of my being able to detect unoxidised phosphorus with any degree of certainty, so that the attempt

was not made. At the time of the post-mortem, however, no gas was evolved from the alimentary canal which would blacken paper moistened with a solution of silver nitrate. It is hence unlikely that any unoxidised phosphorus was retained in the body.

The mother of the child, who, after a drinking bout, had taken some of the poison at the same time as the child (on the 21st) attended the inquest on the 25th, and was then observed to be in apparently fair health. The inquest was adjourned for a week, but meantime the woman became jaundiced, sickened, and died about a week after taking the poison. There was no post-mortem.

In neither of these cases could the quantity of phosphorus taken be ascertained.

The following case occurred in the practices of Dr. Henry Lewis and Mr. W. J. Tyson, at Folkestone.

A female servant, æt. 20 years, whilst under the influence of religious excitement, took some phosphorus rat-paste, with suicidal intent. She took the first dose on the evening of January 11th, and repeated the dose three times the next day. The whole quantity taken amounted to a piece of rat-paste the size of a large cob-nut. On the morning of the 13th she retched, and at dinner-time the same day her appetite failed. In the evening she vomited. Next day she told a lady what she had done, and at 10 p.m. she was seen for the first time by a medical man, about seventy-two hours after the administration of the first, and forty-eight hours after the last dose of the poison. For the last twenty-four hours she had been retching, but, apparently, not vomiting. She had now a wild, excited look. Her breath smelt of garlic. There was tenderness at the epigastrium; no heat of skin. Pulse 80; respiration normal.

January 15th, 2 p.m.—Skin natural. Pulse 80; respiration normal. Slight yellowness of the conjunctivæ; pain at the epigastrium and slight nausea, but no vomiting. She had lost the excited look. She complained of soreness of the mouth; urine loaded with lithates and very high-coloured; no nervous symptoms apparent. She was ordered Ol. Tereb. three times a day and milk diet. The breath, urine, and fæces smelt of garlic. At 9.30 p.m. the pulse was 84, and the temperature 98.4°.

16th, 11 a.m.—Slight odour of breath only. The whole body jaundiced, the limbs only slightly so. Conjunctivæ quite yellow; mind clear. Pulse 100; respiration 26; temperature 98.4° . Chest sounds normal. Nausea, but no vomiting; great thirst; felt very weak. In the evening the temperature had risen to 99.6° , and she complained of frontal headache and great malaise. Fæces drab-coloured; neither these nor the urine had now any luminosity or garlicky odour. Twenty-two fluid ounces of high-coloured urine had been passed within the twenty-four hours, of sp. gr. 1030, albuminous, acid to test-paper, and containing bile-pigment. The spleen could not be felt, and the hepatic dulness did not transgress the normal limits. Slight vomiting in the evening.

17th, 9.30 a.m.—Pulse 108, weak; respiration 36; temperature 99.2° . Thirsty. Abdomen a little prominent. Breath with slight phosphoric odour. Jaundice as yesterday, but “sees things yellow.” Hepatic dulness extending from sixth rib to an inch and a half below the margin of the ribs. The spleen could not be felt. Much nausea, but no vomiting. Great pain and tenderness at epigastrium; had passed a drab-coloured solid stool. This morning she passed eight or nine ounces of urine, the first since the preceding night, of sp. gr. 1030, albuminous, acid, and of a dark sherry colour. Tongue slightly furred; dryness of throat; perspired very little. In the evening she wandered a little; and at midnight a marked change for the worse supervened.

From this time she rapidly sank. The skin became cold and clammy. She passed her evacuations under her. Sickness and retching came on. She became very restless, but remained sensible until her death at 11 a.m. on the 18th, a week after taking the first dose of the poison.

Post-mortem examination, made twenty-two hours after death.—Whole surface jaundiced. No œdema. No subcutaneous hæmorrhage. *Lungs* presented a little lymph and effusion of blood at the base on the right side. *Heart* yellowish, fairly firm, of average size. Under the microscope its fibres exhibited marked fatty degeneration, the transverse striæ being invisible and the fatty granules very distinct. *Liver* of average size, smooth, pale, bloodless, and of a yellowish colour. On section no blood escaped from it. Around

each hepatic vein was an irregular area of a yellowish colour, which under the microscope appeared to be altogether fatty. The whole structure was in an advanced state of fatty degeneration, the cells being loaded with fat-granules. *Spleen* normal. *Kidneys* yellowish on the surface, but otherwise healthy in appearance. All the serous membranes were more or less of a yellowish colour. There was no erosion of the stomach, which was almost filled with a blackish syrupy liquid.

No analysis was made of the visceral contents.¹

A small pot of phosphorus paste as usually sold contains, according to my own analysis, 135 grains of paste, containing 4.18 per cent. of phosphorus, a small quantity of this being in an oxidised form. A whole pot thus contains 5.64 grains of phosphorus, and about five grains is probably the maximum quantity taken by the woman and her daughter conjointly whose cases I have just related. In Mr. Tyson's case the dose was probably under two grains, taken in four doses.

What I particularly wish to point out is, that acute or semi-acute phosphorus poisoning is of a very insidious character, and may easily escape detection. After taking the poison there is commonly some gastric irritation, not very severe, and pretty speedily passing off after vomiting. The patient may then be apparently in his or her usual health, and there may be no peculiarity of the breath to attract attention. This was very well illustrated in the case of the girl who died in the hospital. After an interval which may vary from a day or two to four or five days, thirst, dryness of the throat, slight jaundice, and sometimes petechial spots, may appear; the patient becomes prostrated; nervous symptoms may be either prominent or absent; the urine becomes scanty, high-coloured, tinged with bile, and albuminous. The patient succumbs within a week or so at the utmost, and a post-mortem examination reveals extensive fatty degeneration of the organs, more especially of the liver, kidneys, and heart. The rapidity with which these changes occur is enormous. In the case of the little girl the change was very advanced, though she died on the third day after taking the poison.

¹ This case was communicated by Mr. Tyson to the South-Eastern Branch of the British Medical Association on May 24th, 1877.

ON
THE CURE OF VARICES BY EXCISION.

BY H. G. HOWSE, M.S.

CASE 1 (reported by Mr. J. T. Knight).—On December 4th, 1873, a patient named Rose W—, æt. 27, single, by occupation a cook, was sent up to Guy's Hospital from Bedford, and was admitted under my care into Martha ward. She had been suffering for five or six years from enlarged veins in the right leg, which had at times given her considerable inconvenience, and incapacitated her from performing her usual work. She had not otherwise suffered from ill-health, and did not know of any cause which could produce the enlargement.

On examining the leg a deep blue, oval, slightly elevated patch, about two and a half inches in its long diameter, was discovered on its outer side. She said that the blue colour had been noticed ever since birth, so that we thought it was most probably a degenerating nævus. The skin around it, covering the outer and upper half of the leg, was of a similar though lighter tint, but close examination showed that the blueness—unlike that seen in the elevation—was due to capillary venous congestion, the individual vessels being visible with a lens. Spreading down the leg from the nævoid elevation as from a centre were several enlarged and very varicose veins, some of them more than a quarter of an inch across.

One or two of these were hard and cord-like, as if partially plugged with fibrin. There was no varicosity above the knee, nor was anything abnormal to be detected in the groin about the internal saphena vein. Below the knee the varicose veins were not especially connected with either saphena vein, the largest one being on the anterior aspect of the tibia. There were no varicose veins about the left leg, and the patient was otherwise in perfect health.

Two views were taken about this case by those who examined it:

1. That it was a simple case of varicose veins confined to one extremity. That the diffused blueness was simply the capillary varicosity frequently seen in such cases, and that the blue elevation was an aggravated form of capillary varicosity, attended with pigment deposition and an accidental formation of fat in that region.

2. That the patient had had a nævus in this region since childhood; that this had undergone partial conversion into adipose tissue, and that during this process the passage of blood in the veins leading up to and through it had been obstructed, and hence varicosities had formed in the vessels below.

The latter was the view which I myself favoured, and it seemed to me supported by the fact that the patient had had a blue mark in the leg since childhood. I could not otherwise account for the varicose veins being confined to this leg, and principally to the veins passing up through the affected patch of skin.

Treatment.—Whichever view was adopted, I thought that we might safely adopt the following operation, viz. excise the blue elevation with the subcutaneous fat, divide the veins running up to it, and either apply pressure to them or else ligature them with antiseptic gut. On December 19th, accordingly, the patient was placed under the influence of chloroform, and an ovoid incision made around the elevated portion of skin. The included piece was quickly excised, with all the tissues down to the level of the deep fascia. Three or four large veins partially filled with dark-coloured coagulum, but with a patent channel in the centre, were divided and ligatured. The edges of the skin were brought together with

gut suture immediately afterwards, but a very considerable amount of tension was thus thrown upon the skin. Carbolic spray was used throughout the operation, and the wound was dressed with antiseptic gauze.

On making a section of the removed mass it appeared to consist of fat with numerous exceedingly tortuous veins running through it, each vein partially filled with black coagulum. Microscopical examination did not show anything more; hence the cause of the varicosity remains doubtful, and all we can say is that at the time of the operation no remains of true nævoid tissue existed in it.

No material alteration in the patient's state took place until the 23rd, when the leg became painful, the patient feverish (temp. 103°), the tongue furred, &c. On examining the wound a little inflammation was manifest around the edges. The sutures were accordingly withdrawn, when the tension put on the skin was rendered plain by the wound gaping to its full extent, leaving uncovered the deep fascia, on the surface of which no lymph or granulation tissue had yet appeared.

The next day the patient felt much better, the temperature had fallen to 101° , but there was a slight reddish blush extending down the course of one of the principal varicose veins for four or five inches.

On the 26th the temperature had fallen to 100° , the blush had concentrated itself into a little abscess about one inch long, two inches below the wound. This was opened and a small quantity of pus evacuated.

From this time her recovery, though slow, was unimpeded by a single check. On the 28th the temperature was 99° , shreds of the fascial tissue were being thrown off from the wound, and granulation was appearing here and there as islands through it. On January 9th it was perfectly covered with rather bluish granulation, from which there was considerable tendency to venous hæmorrhage. On this account the formation of skin over it was but slow, in spite of skin grafting and sundry changes of dressings, and it was not until the beginning of March that the wound was entirely healed. All trace of varicose veins had then disappeared from the legs. The manner of their disappearance had been watched by us and easily followed. Firstly, the vein became absolutely blocked

by fibrinous coagulum, and could be felt as a hard cord rolling beneath the finger; secondly, the blue colour disappeared, though the cord could still be felt, but not rolling under the finger, from its surrounding connective tissue adhesions becoming more intimate; and finally, all trace of the cord was lost.

The patient remained in the hospital till March 27th, having then been about the ward for nearly a month. She left wearing a light elastic stocking, which I thought it prudent to order for her, as her work necessitated much standing. She had not, however, experienced any inconvenience from the leg, neither from œdema nor from any other cause, although she had been actively assisting in the work of the ward for some week or two before leaving. It should be mentioned that she had, previous to the operation, tried wearing an elastic stocking, but without relief. This may easily be accounted for by the existence of the partial coagulum in the veins. Indeed it is easy to see that the putting on of an elastic stocking in this condition is not altogether unattended with risk. Supposing in this state of partial patency of the venous channels any of the coagulum on the walls had been dislodged, all the symptoms of pulmonary embolism would probably have occurred. No doubt this coagulation is the first step towards spontaneous cure, but Nature appears to work so very slowly in her efforts in this direction that it seems desirable to quicken the progress of the cure by some such operation as is here described.

This patient has been heard of two or three times since leaving the hospital. The last occasion was about a year ago, when the report stated that she remained quite well, with no tendency to any return of the varicosity, and able to do her work perfectly. She had not worn any artificial support for the veins of the leg since a short time after leaving the hospital.

This case was in many respects peculiar, but its success encouraged me to hope that the operation of excision might be extensively available for the relief of persons suffering from varicose veins, more especially in the young and middle aged. Accordingly, on September 10th, 1874, I applied the same operation for the cure of varices of the testicle, with the results detailed further on. (Case 6 and subsequent ones.)

So deeply rooted, however, is the popular belief that there is no surgical cure for varicose veins of the leg, that, though I have seen many suitable cases for operation both in private and hospital practice, as well as in patients sent to me for examination for the National Truss Society, it was long before I was able to persuade a second patient with varices in the leg to undergo the operation. The reply always made, whenever I proposed the radical cure, was that the patient had been told that there was no cure for the affection, and that surgical treatment was attended with great risk. Consequently they were unwilling to have anything done. My colleague, Mr. Davies-Colley, has been, however, more successful, and he has recorded the result in two cases in a paper in one of our volumes ('Guy's Hospital Reports' for 1875, vol. xx, p. 431). With his conclusions in that paper I entirely agree; and I may add to them the following fact, as an illustration of the risks of the ordinary pin operation for varicose veins, that I saw in one of the Parisian hospitals, when studying there some years ago, the case of a man in whom gangrene of the whole of the leg from septic phlebitis had taken place as a result of this mode of treating them. No doubt this but rarely takes place; nevertheless it is a risk which would make me hesitate in adopting any such operation in many cases. At Guy's I have scarcely ever seen this operation resorted to, and have had consequently very little experience of this kind to appeal to. The operation which I have seen employed more frequently than any other (in some half dozen cases) is that which has been practised by Mr. Durham, who in the case of a large varix of the leg circumscribes it by putting on pressure above and below, either with or without needles, and then injects a solution of neutral persulphate of iron into the cavity of the vein, whereby the blood is coagulated, and the flow of blood through it stopped even when the pressure is removed above and below. The risk with this operation—as with all injecting operations for the cure of varices—is that with any given varix it is very difficult to say whether a transverse vein or two may not join it even when the main channel above and below is obstructed. And if there is such a channel existing the risks of injecting any coagulating fluid are evident, seeing that the fibrinous coagulum may be carried into the general

venous circulation and give rise to death from pulmonary embolism, just as we have seen deaths take place in a similar manner from injecting nævi. On the other hand, in the persulphate a powerfully antiseptic fluid is injected, and hence the inflammation excited is not likely to spread as a septic inflammation does, along the internal coat of the vein, even when suppuration is excited. Nevertheless suppuration in the inside of a vein must always be regarded as an ugly element in the treatment of a case. The theory which leads to the adoption of this treatment is that it ought never to be produced, that only just so much of the coagulating fluid ought to be thrown in as is sufficient to ensure the coagulation of the blood. But, granted varices of different sizes, it is not always easy nicely to adjust the requisite quantity of the coagulating fluid, and any excess will excite too much action and so cause pus production.

With an excision performed under the carbolic spray nothing of this kind is to be apprehended. The vein is cleanly cut across and ligatured with antiseptic gut; and if the wound does not heal entirely primarily, the suppuration is all external to the vein, and is confined to an open sore.

It may be said that my own case proves the contrary, and that with the best antiseptic precautions I got a small suppuration in the course of one of the divided veins. It is, however, to be noted that the suppuration was excited by the very large amount of coagulated fibrin *in the part of the vessel below the excision*. There could not, therefore, be any risk of the pus and fibrin being carried up into the general venous circulation. And it is not likely that the same thing would take place in the vein *above* the part excised, because this portion would have no blood flowing into it; it would therefore be empty and would contract. It is to be remembered, too, that this was the first case that had been operated upon in this way, and in some respects I undoubtedly adopted methods which, with my present experience, I cannot defend, and which I certainly shall not repeat. For example, the skin was much too tightly strained and drawn together; this caused retention of the serous discharges, which ran down the cellular tissue surrounding the vein and set up inflammation in it. Again, I do not now think it good policy to remove all

the fat down to the level of the deep fascia and leave that as the floor of the wound. Deep fascia is composed of white fibrous tissue, and is very analogous to tendon in structure. It is but feebly supplied with blood, and consequently does not form a good medium for primary union. It would be better by far in any such case to dissect it off the underlying muscle, and let that adhere primarily to the skin. Muscle is richly supplied with blood, and how easily it adheres to the fat of a skin flap may be frequently seen in a breast excision, when the pectoralis major is laid bare over a large area. Under these circumstances a new deep fascia quickly develops itself from the inflammatory connective tissue formed in the process of repair.

But in all ordinary cases of operation for varicose veins there is not the smallest reason for excising any skin at all. All that is necessary is to make a longitudinal incision over the vein which it is desired to obliterate, to ligature it at the upper and lower ends of the wound, and to cut out the intervening piece. The skin falls together naturally, and primary union as a rule takes place. This is the result obtained by me in the cases about to be detailed, and also by Mr. Davies-Colley in several subsequent cases of varices of the legs which he has operated upon. Moreover, Mr. John Marshall, of University College, has obtained like success in a case operated upon by him subsequently to my first case and to those operated on by Mr. Davies-Colley ('British Medical Journal,' January 23rd, 1875), though the safety of this method of curing varicose veins *with the antiseptic spray* seems to have occurred to him independently.¹

It has been objected to this operation that it is a much more severe one than the pinning procedure. Those persons who make this objection seem to measure the severity of an

¹ The operation of vein deligation is, as Mr. Davies-Colley has shown, a very old one. It was abandoned apparently because of the cases of septic phlebitis occurring after its employment. Mr. Charles Steele, of Bristol, has recently ('Brit. Med. Journ.,' January 30th, 1875, p. 139) recorded some satisfactory cases where he has had recourse to the old operation. But as these cases were operated on without antiseptic precautions, I cannot help thinking that, if his example is much followed, the old experience will repeat itself. The same remark would apply to the operation recommended by Mr. Gay in his well-known work on the subject.

operation by the amount of skin cut, and as only punctures are made by the pins, therefore it is considered as a less severe operation. Those who reason thus forget that in a pinning operation the skin and the vein not unfrequently ulcerate as a result of the prèssure, and that any operation which depends for its success on continuous pressure on such a sensitive structure as skin involves much more pain and constitutional disturbance than a clean-cut wound. Indeed, the late Sir William Fergusson recommended that the pins should be allowed to remain, with the silk on them, until they had "excited considerable swelling and slight ulceration;" stating, further, that "in some instances they might be left until they had separated by ulceration *through both vein and skin.*" And he justifies this recommendation by recording that in one case he compressed an inch or more of the enlarged internal saphena vein, and on withdrawing the pins before much inflammation was excited found that the blood again circulated through the vein in a scarcely diminished volume ('System of Practical Surgery,' fifth edition, p. 377). To follow this advice would be to produce quite as large a wound as that caused by the operation I am now advocating; a wound, too, which is much more ugly in character, as having been produced by ulceration, the result of pressure, than a clean-cut antiseptic wound.

Moreover, Mr. Davies-Colley, in the excellent paper before referred to, has advanced one very cogent objection to the pinning operation, founded on an observation made in one of his cases, which is worthy the attention of all who think of adopting the pins; I refer to the risk of transfixing a deeper important but unnoticed vein, which may run parallel with the varicose vein (Case 1, George G—).

Another very great objection to the pinning operation, as recommended by Mr. Lee, is that it is not easy to make it into an antiseptic operation, and that even were it done with antiseptic precautions the sticking out of the rigid pin would possibly cause the antiseptic to fail from admission of air under the dressings. Of course those who do not practise antiseptic surgery will fail to see the force of this objection, though it is of great importance to those who, like myself, believe in the deleterious effect of dust carried in from with-

out on to wounded surfaces. But quite apart from this, I believe that excision will be found a simpler, easier, and safer operation than pinning, though it may involve a rather larger skin wound at first.

CASE 2 (reported by Mr. G. S. Perkins).—Eliza S—, æt. 52, was admitted on April 5th, 1876. She is married, has six living children, has had no previous severe illnesses except bronchitis last winter. Two years ago she sprained her left ankle; the leg swelled a good deal, and cold-water bandages were applied; three months after, before it was well, she knocked the leg against a box, inflicting a wound which speedily spread by ulceration. She then attended as an out-patient for about four months, but getting worse was unable to continue her attendance, and has since been under treatment at her own home. She has had varicose veins in the left leg for two years, which she attributes to the accidents above described; lately they have given rise to considerable œdema of the foot, but no special treatment has been adopted for them.

On admission there is a considerable patch of eczema on the left leg, with central ulceration. There is a good deal of general varicosity of the veins in the upper half of the leg, but two vessels are more especially prominent; they run from the eczematous patch, are exceedingly varicose, but unite together into one trunk just below the inner side of the patella.

On April 13th chloroform was given, and an incision an inch and a quarter long was made just above the point where the two varicose veins joined. The vein having been exposed, an aneurism needle armed with antiseptic gut was passed underneath the vein, first at the upper extremity of the wound and then at the lower. The ligatures having been tightened, the intervening portion of vein, three quarters of an inch in length, was cut away. No suture was applied to the wound. It was covered with ordinary gauze dressing. The whole operation was performed under the spray. The piece of vein removed contained two valves; the coats of the vein were generally thickened, and its calibre enlarged.

Without detailing the full report of the patient, it may be noted that no rise of temperature took place, that the sore on

the leg began immediately to improve and rapidly scabbed over, while the eczema itself showed signs of being greatly benefited by the operation. On the 15th it is noted that the veins leading up to the obliterated part are hard and cord-like. These gradually became absorbed and disappeared in the course of the two or three weeks following the operation. At the first dressing it was found that considerable retraction of the skin forming the edges of the wound had taken place. This left a sore, healthily granulating, but exceedingly indolent as far as regards the skinning process. It was not until May 24th that this patient left the hospital, the sore having been then healed about a fortnight.

In this case the patient's age and the exceedingly unhealthy condition of the tissues contributed to the length of time of the sore in healing. It would probably have been better if a single metallic suture had been inserted and the skin edges prevented thereby from retracting so much. No undue tension would thus have been put on the wound, as no skin had been removed.

CASE 3 (reported by Mr. John Davies).—Sarah W—, æt. 41, servant, was admitted into Dorcas ward on November 21st, 1876. Is suffering from an exceedingly varicose condition of the veins of both lower extremities. This state has been gradually increasing for three years. A month ago they became knotted and very painful; this was attended with considerable swelling of both extremities, but more especially the right. On this side two knots of inflamed and very varicose veins are especially perceptible, the one on the inner side of the thigh, the other on the leg.

On the 28th, after a few days' rest in the recumbent posture, chloroform was given and an incision about three inches long was made on the inner side of the thigh, rather below its middle, over the knot of inflamed and varicose veins there visible. Considerable difficulty was experienced in isolating the vein on account of all the surrounding tissues being so matted to it by inflammatory material. Two or three superficial veins, small in size and plugged with fibrin, were cut through. Finally a large patent vein was found

running through the mass; this was isolated, and about one inch and a half removed, the ends having been secured with gut ligature. Three metallic sutures were used for bringing the wound together, and the whole was dressed in the usual way with antiseptic gauze.

With the exception of a slight rise on the day following the operation, due probably to the chloroform, the temperature remained normal throughout. The wound healed by primary adhesion. The improvement in this case was not so striking as in the others recorded, and it may be a question how much of the final improvement was due to the operation, and how much to rest. Nor is this to be wondered at. The condition of varicosity was so general, extending even to the capillaries, that from the first we were not very hopeful of doing much good. She, however, gradually got better, the varicose veins diminished, and the inflamed veins gradually disappeared. On December 21st she was able to be up and about the wards, and on January 7th she left the hospital.

CASE 4 (reported by Mr. J. W. Nicholson).—J. C—, æt. 21, a fireman, was admitted into Naaman ward on December 5th, 1876. He states that he has had a large vein on the inner side of the right leg as long as he can remember. About three years ago a large painful swelling formed on the inner side of the right calf; the skin over this broke and the swelling discharged some blood; he kept this bandaged up, and under the steady pressure the swelling has decreased, but it has not entirely disappeared. Two days before admission he was seized with cramp in his leg, and it became much swollen below the knee, and very painful. As this incapacitated him from work he was induced to apply for admission. With the exception of variola seven years ago he has had no other illness.

State on admission.—Is a strong healthy athletic young man. The internal saphenous vein is swollen and cord-like both below and above the knee. Above the knee it can be traced diminishing in size nearly up to the saphenous opening; below the knee it is varicose, and extends down by some of its branches towards an ulcer, about an inch in diameter, on the inner side of the right calf. Around this ulcer the

tissue is indurated for an area of two and a half by two inches. This induration consists of a congeries of varicose veins filled with coagulum. The surrounding skin is considerably inflamed. On examining the ulcer the floor of it is seen to be formed of the lining membrane of some of the convoluted veins; black clot obstructing the vein-cavity is seen here and there adhering to the walls; the discharge from the ulcer is very offensive, and is stained with blood. The leg and foot below the ulcer are very œdematous. He was ordered—

℞ Tinct. Ferri Perchlor., mxxv,
Magnesiæ Sulphatis, ʒj,
Glycerini, ʒj.
Ex. Inf. Quassia, ʒj, t. d. s.

The recumbent posture with the leg higher than the body was strictly enforced.

On December 7th the œdema of the leg had much diminished, and the patient felt comfortable and free from pain. But as the discharge continued offensive he was ordered—

℞ Ung. Resinæ pro applicatione.

On December 12th, the œdema having entirely subsided, the patient was placed under chloroform, and an incision in the lower third of the thigh, about two inches long, was made over the prominent vein. This being exposed, an aneurism needle armed with antiseptic gut was passed under the vessel at the upper and lower end of the incision, and the vessel ligatured in two places. The intervening portion of the vein, about one inch in length, was then cut away. The gut ligatures (No. 1) having been cut short, the wound was closed by three wire sutures. The operation was performed with all the established antiseptic precautions.

The discharge from the ulcer being very offensive, it was cauterized with nitric acid and nitrate of silver very thoroughly, and a carbolic gauze dressing afterwards applied.

The walls of the portion of vein removed were very thick, but there was no clot inside. The cord-like feeling was therefore entirely due to the parietal thickening.

On December 16th, the temperature having remained perfectly normal, and the patient having felt, as he expressed

it, "as if no operation at all had been done," the sutures were removed; the wound was then found entirely united by first intention, with the exception of one or two little points of granulation peeping up between the edges of the skin, where the coaptation of the edges had not been quite so perfect as elsewhere.

The varicose ulcer on the leg was, however, a much more troublesome affair. It was not until January 13th that the slough separated, *i. e.*, more than a month after the application of the nitric acid, and it was not for another month that the ulcer entirely skinned over. The reason for this slowness of action was not far to seek. All round the ulcer was a mass of indurated tissue consisting mainly of obstructed veins, between which the capillary blood supply must have had great difficulty in making its way. Indeed it was not until the mass of indurated tissue had been removed by absorption that skin began to form at all rapidly over the granulation. It is to be noted that such absorption would not have been possible if the vein had remained patent, and thus the weight of the column of blood had remained pressing upon the affected spot. Or even if, with the recumbent posture, it had taken place, the affection would have been far more likely to return when he resumed the erect position than it now is. This is the only way in which the long history of three years, given with this case, is capable of being accounted for.

Various causes combined to delay this patient's departure from the hospital, and he did not finally leave until February 28th, having then been about the ward for three weeks, and having proved himself a most useful assistant in the ward work for the whole time that he had been up.

CASE 5 (reported by Mr. S. Edwards).—E. H—, æt. 25, a healthy-looking married woman with three children, was admitted into Dorcas ward on March 3rd, 1877. Has never been ill until three years ago, when the veins of the left leg became varicose and painful, and she attended the out-patients' under Mr. Howse for two years on and off, but did not receive much benefit. She then passed a year in the country, but on her return to town presented herself again for treatment, the veins having considerably increased in size.

On admission a large very varicose vein was found on the inner side of the thigh over its lower half. This was joined near the knee by another very varicose vein which proceeded from the anterior part of the leg, and ran upwards over the patella.

On March 9th chloroform was given, and an incision about one inch long was made over the internal saphena vein in the lower third of the thigh. About half an inch of this was removed in the usual way. A second incision, also about one inch long, was made over the vein running in front of the patella, and the same amount of this was excised; and a third incision was made over another vein in the upper half of the leg, and a small piece of vein excised here also. All these wounds were closed with wire sutures, the usual antiseptic precautions having been observed.

No rise in temperature or constitutional disturbance followed this operation. The two lower wounds closed absolutely by immediate union. The edges of the upper wound separated very slightly, permitting a narrow line of granulation material to be visible. This speedily healed, and the patient left the hospital on March 28th.

This case raises the question whether it is best to excise several small pieces of varicose vein in different parts of its course, as in this patient; or one larger piece, as in the other cases recorded here. Mr. Davies-Colley is in favour of the former plan, and tells me that he has carried it out in several cases which he has operated on since the date of the paper before referred to. This plan has the advantage of occluding the vein at several points, so that cross-branches and communications can no longer maintain the varicosity, after the chief varicose trunk has been obstructed. I am inclined to think that it is the method which will be employed for the future.

The arguments that I have been urging above may be brought forward with still greater force for excision in the case of varicocele. The cases in which I have performed the operation are the following:

CASE 6 (reported by Mr. H. W. Ewen).—H. S—, æt. 23,

unmarried, a clerk, was admitted into Luke ward on September 10th, 1874, suffering from a large varicocele of the left side, which, he states, had existed there ever since the age of puberty, but had at first varied very considerably in size. Of late it had increased steadily, and given rise to much dragging pain in the groin and lumbar region. The right testis is quite natural in size; the left is rather smaller than the right, but the difference is not considerable.

This man came to me at first at the out-patients' complaining of this affection. He was undeniably odd and strange in his manner, but still I saw nothing to lead me to believe that he was really insane, nor apparently had his friends considered him as such. I thought that his oddities might possibly be due to the trouble about his generative organs, seeing how frequently we find affections of this kind prey upon the mental health of those who suffer from them. I therefore recommended him to come into the hospital for the sake of getting rid of the trouble, explaining to him the result of the operation in causing coagulation of the blood in the veins beyond the part removed, and the consequent length of time which must elapse after the operation before the parts would return to quite their normal condition.

On September 11th the patient was placed under chloroform and a longitudinal incision, about an inch and a half long, starting from a point about half an inch below the external ring, was made over the varix. This was grasped with the fingers, brought out of the wound, and separated from the vas deferens, which in this case was easily made out. A double gut ligature was then passed round the varix, and it was ligatured at the upper extremity of the wound and again at the lower end. The gut sutures were cut off short, and dropped into the wound. The portion of the varicocele, about two inches in length, intervening between the ligatures, was then cut out, and the skin united by a single gut suture. Not half a teaspoonful of blood was lost during the entire operation. The carbolic spray was employed during the whole time, and a gauze dressing afterwards applied to the wound.

No constitutional disturbance followed the operation. The temperature, pulse, and respiration remained absolutely

normal. The patient had no pain, and his only complaint was of feeling "weak," but as he had complained of this equally before the operation, no significance could be attached to it. Before the end of September he was walking about the ward with the cicatrix firmly consolidated, and he was discharged from the hospital on October 3rd. During the whole time that he was in the hospital his eccentricities and oddities were such as to lead the sister and the nurses to the belief that he was decidedly insane. This impression was not diminished by the fact that the first visiting day after his discharge he came back with stick and bundle, walked into the ward straight up to the bed he had occupied, saying that he was no better, that that was his bed, and there he should stay! It was only when he was informed that the bed had been occupied by somebody else, and that patients who had been discharged could not be readmitted in that manner, that he consented to take his departure.

I did not see him at this time, and though I have made efforts to get a personal examination of him since, I have not succeeded. I learnt, however, from his mother twenty months after the operation that he was quite well, and able to follow his usual occupation.

Here, then, we have evidence of great good having been done, for not only has the varicocele been cured, but a mental state closely bordering on insanity has been checked, if not entirely got rid of. The fact that he returned three days after his discharge saying that he was no better must not be taken into account at all. With this operation it is absolutely necessary to impress upon the minds of the patients before the operation that no apparent good will follow *immediately* upon it. On account of the stasis in the veins left behind the blood coagulates in them and forms a hard knotted mass in the scrotum quite as large, if not larger, and much harder than the original varicocele. Consequently the patient feels much of the dragging pain which he experienced at first. It is only after the absorption of this—a period varying from one to four months—that he begins to experience the great benefit of the operation. This had been fully explained to the patient, but it is probable that his brain had been quite incapable of taking it in.

CASE 7 (reported by Mr. J. A. Masters).—J. G—, æt. 33, married, was admitted into Lazarus ward on November 21st, 1874. He was suffering from a large varicocele on the left side, with severe dragging pain along the groin and in the lumbar region of the spine. He had also noticed a peculiar sweating on the left side of the scrotum. There was undue impulse in the inguinal region on coughing, which appeared to be caused by a partial descent of the bowel.

The veins constituting the varicocele were very large and many of them thickened and cord-like, so that it was absolutely impossible to tell which was vas deferens. The testis appeared to be nearly normal.

There was a history of blow on the left testis fifteen years ago; he was laid up for six or seven weeks, but he had not noticed this affection until eight or nine years ago. It was then already of considerable size when he was in the erect position, though nearly disappearing when lying down.

On November 24th chloroform was given, the patient sitting upright in a chair, and an incision two inches long was made over the root of the scrotum below the external ring. The veins quickly bulged through the wound. It was, however, found very difficult to make out the vas deferens, which was completely surrounded by and adherent to knotted veins. In dissecting it out the tunica vaginalis was accidentally opened. A gut ligature was then tied above and below, and the intervening portion of varicocele, about two inches and a half long, removed. The wound was closed by a single suture.

No constitutional symptoms followed the operation. The wound was entirely healed in three weeks, so that no bad effect followed the opening of the tunica vaginalis. The usual coagulation of blood in the varicocele took place, giving rise to some apparent swelling about the scrotum. He was allowed to get up and be about the ward on December 18th, but as he still complained of pain in the groin when in the erect position, and as there was now very evidently undue inguinal impulse, I recommended that he should wear a light truss for a time. This he did not finally obtain (Christmas intervening) until January 5th, when he was discharged from the hospital well, but with the solidified varix not yet, of course, absorbed.

I have made efforts to trace this patient since his leaving the hospital, as the case is a particularly interesting one, on account of the relation presented between inguinal-hernia and varicocele, but have not been able to find him.

The operation was done in the sitting position in this case, because I thought it might facilitate the isolation of the varix. It is, however, a very awkward position to do an operation upon the scrotum; and though the veins undoubtedly bulge through the wound more readily, yet I do not think this constitutes any sufficient advantage to compensate for its awkwardness. In the cases in which I have operated in the recumbent position I have not found any difficulty in securing the varix. It will be noticed that in this case the tunica vaginalis was opened, partly, I think, on account of the awkwardness of my position when doing the operation, partly on account of the portentous way in which the distended veins protruded from the incision when the superficial tissues were divided. This accident, which might cause awkward suppuration of the tunica vaginalis in a non-antiseptic case, appears to have not the remotest ill effect in retarding the subsequent cure when the operation is performed antiseptically.

CASE 8 (reported by Messrs. Stanger, West Jones, and Meek).—R. H—, æt. 22, railway guard, was admitted into Naaman ward, on April 9th, 1875.

He had been sent to my house on account of the very large varicocele from which he was suffering, and which literally resembled what he called it, "a bag of worms." It was the largest varicocele which I have ever seen, and caused the scrotum on the left side to hang down about three inches lower than natural. There was a history of gonorrhœa two and a half years before, and of late he had been troubled with frequent seminal emissions. He complained of the usual dragging pain in the groin and lumbar region of the back. There was slight impulse in the groin perceptible on coughing, but not to any very marked extent. The left testis was small and wasted; the right was rather small, but not nearly so much so as the left.

On April 11th chloroform was given, the patient sitting in

a chair; and the usual incision was made at the root of the scrotum. The veins readily bulged from the incision after the division of the fascia, but in separating them from the vas deferens the tunica vaginalis was opened. A length of about two inches of varicocele was then doubly ligatured and cut out in the usual way, the wound being closed by a single suture.

No bad symptoms followed the operation. The temperature never rose above normal, and he professed himself free from pain. On May 1st a few exuberant granulations were touched with nitrate of silver, and on May 8th he went out quite well. I saw this patient about six months after the operation. The varicocele had entirely disappeared; there was no undue impulse in the groin on coughing, and the affected testis seemed to me (and to the patient also) to have materially increased in size.

CASE 9.—H. M—, æt. 23, was sent to my house on December 12th, 1875, as a patient suffering from venereal trouble. He told me that he had contracted gonorrhœa nearly two years before, and that for nearly the whole period he had been under the care of various London quacks, the last of whom was still treating him for gleet and stricture. On examining the urethra I could not detect any appreciable amount of abnormal secretion. A No. 12 india-rubber catheter passed quite readily, and he did not complain of the slightest pain or inconvenience in this part. He told me that matters had long been in this state, and that the inconvenience from which he was suffering consisted of a dragging sensation in the groin and pain in the lumbar region of the back, which had been attributed to the results of the alleged stricture. On examining the scrotum a fairly-sized varicocele of the left side was found to exist, and there was slightly increased impulse on coughing on this side in the groin as compared with the right side. Neither testis was at all atrophied. He had lived for some years in hot climates, but since he had been in England he had been very fond of athletic exercises, more especially running. This he had of late nearly given up on account of the inconvenience which it caused him.

The pain here seemed fully accounted for by the varicocoele, and certainly could not be considered referable to the condition of the urethra. I therefore proposed to him the operation for obliterating the veins, to which he readily consented. Accordingly on February 10th, 1876, chloroform was given at his own house, and the usual operation, as described above, performed. The patient was in the recumbent position, and the tunica vaginalis was not opened. The main mass of the varicocoele was cut out, but two small veins, lying directly on the vas deferens, were simply ligatured with No. 0 antiseptic gut.

Nearly all the wound healed by primary adhesion. He was kept quiet in bed for two weeks after the operation, so as to avoid the risk of any coagulum, which might have accidentally formed above the ligature, getting detached. At the end of this time he was permitted to get up and about, and in three weeks after the operation he resumed business. I examined this case about seven weeks after the operation at my own house. The veins were all solid and blocked with coagulum. He had been at *full* work at business for the last three weeks, and was suffering from no pain or inconvenience in the groin or back. There still seemed to me, however, some undue impulse in the left groin on coughing, when carefully compared with the right. I therefore recommended him to wear an inguinal truss for a time. This he did for some months.

I saw this case for the last time about a twelvemonth after the operation, when he was about to leave England to return home. He had then discontinued the use of the truss for four or five months. His testimony in favour of the operation was most emphatic. He said:—"The relief has been complete. I am perfectly well, able to run, row, or take any severe exercise I wish." I examined the parts. No trace of any varicocoele remained; the testis seemed of normal size; it was next to impossible to find even the cicatrix of the operation.

CASE 10 (reported by Mr. Geo. Pilkington).—G. S—, æt. 21, a warehouseman, was admitted into Naaman ward on April 11th, 1877.

Three months ago he first noticed a swelling on the left side of the scrotum; this has been gradually getting larger,

and has been attended with a certain amount of discomfort. He has bathed it with cold water, but has otherwise had no treatment. There is no history of any previous illness or injury, but the patient is not a particularly healthy-looking man.

The scrotal swelling communicates the peculiar "bag-of-worms" sensation to the finger; it is much larger in the standing position than in the recumbent; there is slight impulse in coughing; the left testis appears to be smaller and softer than the right. The patient complains of the usual dragging pain running up in the direction of the cord after walking or other exertion.

On April 13th, the patient being under chloroform and in the recumbent position, the usual incision was made and a portion of the varicocele, about an inch and a half long, was excised in the manner previously described. No difficulty was experienced in isolating the vas deferens. A single silver suture was employed in the centre of the wound to maintain the skin edges in contact. The operation was performed under the carbolic spray and dressed with antiseptic gauze.

No constitutional fever or inconvenience followed the operation. The temperature never rose above 99·6 Fahr. The wound was perfectly healed by May 8th, when the patient left the hospital.

Sufficient time has not elapsed in this case to enable me to state the ultimate result, but there seems every reason to believe that it will be as satisfactory as the others have been.

Connection between varicocele and hernia.—In two of the previously recorded cases it will be seen that a slight hernial protrusion existed in the groin coincidently with the existence of the varicocele. I have noticed the same thing in other cases where no operation has been done. A few months ago a man, æt. 41, came before me for examination for the National Truss Society, in whom a left inguinal hernia appeared to be due to a pre-existent varicocele. Hernial impulse was especially well marked in the case of a gentleman brought to me for examination a few weeks ago by Mr. J. C. Wilkinson. In this case we ordered a light truss, to see what relief it would give to the patient's symptoms, before proposing the radical cure. As a rule, however, a truss only

makes a varicocele worse by pressing upon and still farther retarding the circulation in the veins, though it of course gives the required relief to the hernia.

The causation of this connection between varicocele and hernia appears to be sufficiently manifest. The dilated veins press upon the tissues forming the inguinal canal, and expand the walls, so that there is space allowed for the descent of the bowel, if temporarily the blood is squeezed out of the veins; in fact, the veins may here be regarded as performing very much the same part as a Barnes's bag for the os uteri. It would appear, however, from the final result in Case 9 that the dilated canal will readily return to its normal size by wearing a truss a few months after the cure of the varicocele.

It must not, however, be supposed that varicocele is a *common* cause for hernia. Since my attention has been directed to this point, out of all the cases examined for the National Truss Society, only two could be found in whom the varicocele seemed to act as the cause of the hernia.

The facts mentioned above apply also to a certain extent to dilatation of the saphenous aperture. In three cases sent to me for examination, where a very large saphenous varix had been mistaken for a femoral hernia, I found the whole of the crural canal widely dilated by the pressure of the enlarged vein, though not occupied by any bowel. By pressing the blood out of the vein, the finger could be very readily passed into the crural canal through the saphenous opening. Impulse on coughing was a very marked feature in these cases, and rendered the mistake in diagnosis a very pardonable one.

Mode of Operation.—Considerable stress must be laid upon the method of operating which has been described in detailing the cases already recorded. It is quite clear that if *too great care* be taken to ligature all the veins during the operation, that the return blood from the testis may be quite interrupted, and death of the organ take place from moist gangrene. This accident is best avoided by *disturbing the areolar tissue and vessels immediately upon the vas deferens* as little as possible. In operating, the anatomical fact should always be borne in mind that the vessels of the testis run very closely in contact with its duct, the vas deferens. That the sper-

matic artery is a very small one, and that consequently a very small vein is quite sufficient to carry away all the blood which the artery conveys to the organ. If the areolar tissue about the vas deferens be left quite undisturbed, and if it be not fingered too much, a number of small vessels are left uninjured quite sufficient to carry away all the return blood. If, on the other hand, the areolar tissue is much cut about (as is inevitable when the veins are ligatured singly and not *en masse* as here recommended) there will be great danger of totally interrupting the circulation and producing disastrous results.¹ That such results need not be feared with the operation here prescribed is shown by the results now recorded.

Morbid Anatomy and Causation of Varices.—Before leaving this subject one general question in the pathology of varicose veins suggests itself for consideration. By many surgeons all operative interference for the cure of this affection has been objected to on the ground that the cause of the disease is central, and that, therefore, operative measures on the affected veins are measures taken for the treatment of a *symptom* and not for the disease itself. But is this the case? Does varicosity of the veins of the lower extremities depend always upon a central cause for its origin? Does it even owe its cause to some condition within the abdominal cavity, and therefore out of reach of an easy and safe operation? I think not.

Various causes have been assigned by writers at different times for this affection. And it may be conceded at once that a group of cases exists in which the origin of the varicosity is central; for example, where it depends upon pregnancy, or upon some tumour pressing on the vena cava, &c. Such cases are obviously excluded from relief by the operation now advocated. But these cases are comparatively few in number. Other causes which have been assigned are, habitual constipa-

¹ Mr. Annandale has recorded ('Brit. Med. Journ.,' January 30th, 1875, p. 139) a case which he operated upon on November 7th, 1874 (very little after the first of the varicocele cases recorded here) in which he made use of the method of operating here recommended. The result was completely successful. I wish to lay great stress upon this method, because if the operation be extensively copied elsewhere, as I hope it will be, bad results will certainly follow if the anatomical facts upon which the method is founded are not borne in mind.

tion, narrowing of the saphenous opening, long-continued standing or muscular exertion, a peculiar disposition of the external saphenous vein, tight garters, the pressure of an ill-fitting truss, &c.

Of these, habitual constipation can scarcely be regarded as an originating cause, considering the number of persons who suffer in this way without also suffering from varicose veins, though it may be looked upon as a secondary cause, making matters worse when the tendency has already been established. The recognised frequency with which the affection occurs in the right leg (whereas it ought, if this view were correct, to be most frequent in the left) is another argument against regarding constipation as having much influence in causing varicosity.

If the cause be *central*, the varicosity ought mechanically to begin to appear between the obstructing agent and the first valves below it, or at any rate in the piece of vein between the saphenous opening and the first healthily-acting valves below this point. But how very rarely do we see a varicose condition *beginning* in the veins so high up the thigh. It nearly always commences about the veins of the leg, or at any rate not higher than just above the knee. Most of the other causes cited must in the same way be regarded as being merely aiding causes, and not as the primary one.

The view which I have for some time held, and which I am not aware has yet been developed by surgical writers, is that the affection at its onset in the great majority of cases is a purely local one, dependent upon a condition of localised inflammation in the vein wall, similar to the change which we now recognise in arteries as giving rise to atheroma, though possibly not entirely due to the same causes, and certainly not leading to the same results. I think that in all probability the first occurrence of this inflammation is due to local injury, such as knocks or bruises. The exposed condition of the parts where varicose veins generally first begin to form may be considered as an argument in support of this view. But local injury is not enough to account for the inflammation in all cases, because a very large number of persons get such injuries to their vessels without any bad result following. A peculiar constitutional condition must be

superadded, and what that condition is I am not at present prepared to say. Granting this, it must be observed that we are not in a worse state of ignorance about this affection than we are about atheroma and aneurism in the case of the arteries, where the potency of the local condition is admitted beyond dispute. In the latter, syphilis and excess of alcohol are generally admitted as having some share in the production of the lesion; and in the former also it may well be that these two factors may act as powerful predisposing causes, although they are probably not alone in the one case more than in the other.

If we once grant that localised inflammation of the vein wall is the first step in the production of a varicose vein then the remainder becomes easy. One very definite character belonging to all inflamed tissues is the *softening* that they undergo; they lose their power of resistance. Examples of this meet us at every turn throughout the body. Inflamed lung (red hepatisation) is less resisting than healthy; one of the tests constantly made use of in the post-mortem room for red hepatised lung is that the finger readily makes holes in it, whereas it is difficult to make much impression upon the more resisting tissue of healthy lung. A more analogous example, because the tissues are more alike, lies in the changes which take place in chronic disorganisation of a joint, as for instance the knee-joint. Here we have vascularisation of the ligaments, consequent softening, and hence dislocation as a result,—a thing quite impossible when the parts are in a healthy state without very great violence. I believe that a somewhat similar change takes place in the wall of the vein, more especially in the middle coat, whereby it is no longer fit to resist the pressure of the ordinary blood-current. Hence a bulge takes place at the affected part. This is the first commencement of the varicose condition, and directly it has begun it can be shown mechanically that it is a state which will tend to spread, and to involve further and further “reaches” of the vein of its own accord. This is perhaps best understood by considering the analogy of a river flowing through a nearly level alluvial plain. Supposing for an instant that we make this river run a perfectly straight course; it is well known that it will never long continue so,

unless its banks are formed of rigid unyielding stone, and even then it is only a question of time (as seen in all deep water-worn rock gorges), before the stream becomes sinuous and tortuous. Although it is usually considered almost in the light of a law that fluid will take the shortest course possible in reaching its destination, yet this is certainly not the case with a river, which appears almost always to take the most winding and the longest course possible before reaching the sea. I believe that this sinuous course can be shown to be a direct result of the laws of fluid-pressure, but in the case of the river it may be much more easily understood by simply watching the action of a current upon its surrounding banks. Supposing then these banks were in the first place quite straight, in process of time the current, wearing portions of the bank away, would meet with some softer material than elsewhere. This is immediately washed out, while the harder portion remains, and deflects the current sideways. The current now thrown upon the opposite bank tends to eat a concavity out of its straight walls, and from this point is thrown to the opposite side until the sinuous course is propagated all the way down the river-channel to the sea.

Precisely the same thing occurs in the vein. The first bulge takes place at the point where the vein-wall is weakened by the chronic inflammatory process. From this concavity the current is deflected to the opposite side, and hence this begins to bulge also. Nor is it necessary to suppose the active supervention of the chronic inflammatory process at this point. Pathological observation has taught us that any tissue upon which more strain than usual is thrown is, *ceteris paribus*, more likely to undergo the chronic inflammatory process than others; for example, the formation of the sinus maximus of the aorta, and the great tendency which there is to the production of aneurism at this point. Hence it is seen that when once this change has started itself, it tends to propagate itself to the adjoining parts of the vessel. This in itself should be a great argument for the early treatment of the varicose condition, before the mischief has had time to spread to any very great extent.

Hitherto I have abstained from making use of the term

"phlebitis" as the originating cause of the affection under discussion. I have done so because this term has been applied to a special form of vein inflammation to which I do not here refer, but in which the vein becomes hard and cord-like, and obstructed with coagulum which is usually adherent to the vein-wall. I believe this is most frequently of a septicæmic origin. The formation of the coagulum is usually explained by the internal coat of the vein becoming rough under the action of the inflammatory process, which affects it like a serous membrane, hence that fibrin from the blood becomes deposited upon it and the vein obstructed. Hitherto surgical writers have scarcely recognised any other form of "phlebitis" than this.

Nevertheless changes in the vein-wall in the varicose state have been long recognised by pathologists. They have been minutely described by Andral ('Précis d'Anatomie Pathologique,' tome ii, part 1st, p. 400), Rokitansky ('Path. Anat.,' vol. iv, p. 362, Syd. Society), and others, though hitherto they seem to have been regarded almost entirely as a *result* of the extra strain thrown upon the part rather than as a cause; nor, indeed, is this altogether erroneous. It is probable that when the inflamed wall of the vessel has stretched under the strain of the blood-stream it will in many cases tend to hypertrophy in order to compensate for its lost strength and compactness. Analogy points to the same conclusion. The stretched outer coat of an artery forming the wall of an aneurism tends in many cases to an hypertrophy in order to compensate for its weakness. The ventricle of the heart in a case of rheumatic fever, if the muscle should become inflamed, first dilates¹ under the pressure of the blood-stream, and then, if the patient recovers, tends to hypertrophy in order that the circulation may be properly carried on. Hence the thickening so generally observed about the vein-wall in all old cases of varicosity. But this state is probably preceded by one in which the wall has been positively thinner than normal, and this, again, by one, the exact pathological characters of which I am as yet ignorant, but which I think may possibly be somewhat

¹ The correctness of this view of the sequence of events leading to hypertrophy of the heart in rheumatic fever has been disputed, but none the less I believe it to be right.

alike the vascularisation and consequent softening which take place in the fibrous tissues of a chronically inflamed joint.

The vein-wall inflammation of which I have spoken above, is therefore a condition affecting the resisting element in the wall, *i. e.*, the middle coat, and is not at all similar to the phlebitis ordinarily described. I have compared it already to the changes which take place in the arterial wall in the production of atheroma. The differences between the two are, however, so striking that a few words of explanation may be advantageously given to them.

If there be any truth in the comparison between atheroma and this form of vein-wall inflammation, the question may very well be asked, Why are not the phenomena in the two cases alike? Histologically and physiologically, I believe the answer to be a perfectly simple one. They are not alike because the vein-wall differs in structure and function from the arterial wall. The first stage in the atheromatous change in an artery is now almost universally recognised as being due to a chronic inflammation of, or a slow cell-growth amongst (for the expressions are almost synonymous) the tissues forming the middle coat. These cells, springing up everywhere amongst the densely interwoven, fibrous, elastic, and muscular elements of the middle coat, separate them, displace their vascular connections, and thus destroy their vitality, at the same time gradually perishing themselves from an insufficient supply of the same plasma which they have cut off from their parent tissues. Hence they undergo fatty degeneration, and become converted into the well-known pultaceous masses containing cholestearine crystals, shrivelled cells, strange-looking sticks and faggot-like masses (in all probability the relics of the destroyed fibrous elements), and, finally, into calcareous plates.

In the case of the vein these changes do not take place; firstly, because the tissues composing its walls are more extensible and looser, so that the nutrition of its elements is much less easily impaired than in the case of the arterial wall. Hence the pathological changes in the case of a chronic inflammation of the vein-wall tend first to thinning and then to hypertrophy, *i. e.*, tissue-growth and not tissue degeneration. Secondly, because the conditions of blood-pressure are so

different in the two systems of vessels. In the artery the pressure is great and jerky; hence the degenerated wall gives way and permits blood to extravasate under the more extensible external coat, and thus to form an aneurism. In the vein the pressure is slighter but more even and constant; hence the peculiar varicose form which chronic disease of these vessels tends to assume.

Much time has been expended by some writers in considering the question where the varicosity first begins to form in the lower extremities—whether it affects at its commencement the main trunks of the named veins, such as the internal and external saphenous, whether it first affects *branches* of these systems, or whether it commences in the deep veins accompanying the arteries. As regards the latter I have never seen varicosity in the deeper veins where it did not affect also the superficial, and so far my observation does not give any support to the views held by Verneuil. As regards the other two cases I believe that in the slighter commencing cases of varicosity (which alone should be studied to give any trustworthy answer to this question), varicosity will be more often found in the communicating secondary branches of the superficial venous system than in the main trunks, though of course it speedily subsequently spreads to the main trunks. Of the five cases of varicose veins of the lower extremity reported here, only one, viz. Case 4, had the main internal saphenous vein affected. In all the others it was some branch or series of branches which had become the seat of the disease. Nor, indeed, is it always necessary to suppose that a varicose vessel in the position of one of the saphenous trunks indicates disease of that trunk itself. In Mr. Davies-Colley's paper already cited a case is recorded (Case 1) in which he cut down upon, apparently, the internal saphenous vein in a varicose condition, and found that the true saphenous vein lay underneath the varicose vessel in a healthy state. In this case, then, the varicosity must have developed itself in some usually small and unnoticed cutaneous vein, which had increased in size so as to simulate the main trunk itself. These points are of importance as indicating the *local origin* of varicose disease in a very large number of cases; and it is, of course, only in these cases that operation is advisable.

The same line of argument may be applied to varicocele. If it can be shown that varicose veins of the leg commence as a local affection it makes it probable that such may be the origin of the varicose veins of the testis. Indeed, the great number of the veins sometimes cut across in the operation, far larger in amount than can be enumerated in a healthy dissection, makes it almost certain that some very small capillary veins have enlarged in this disease, and contributed to the mass of varicose vessels characteristic of this affection.

STATISTICAL ANALYSIS
OF THE
PATIENTS TREATED IN GUY'S HOSPITAL
DURING THE YEAR 1876.

By J. C. STEELE, M.D.

THE number of patients who received relief from the hospital in the year 1876 amounted altogether to 81,781, of whom 5722 were under treatment in the wards, and the large number of 76,059 were classified under one or other of the separate departments of out-patient relief. When compared with the corresponding returns for the year 1875 these figures present a slight decrease, amounting to 132 in the number of in-patients, but a general increase in the total number from both sources, depending on a small accession to the number of out-patients. The diminished number of in-patients has been almost entirely confined to the medical department, the admissions to the surgical wards being within 4 of those treated during the previous year. This reduction is to be accounted for solely by the mean residence of the medical cases having been slightly extended in the course of the year. The average stay, as calculated over the entire number of patients, amounted to 39·5 days, being two days longer than was the case in the preceding year, and is the highest on record with the exception of the year 1873, when it was a fraction more, namely 39·8 days. The extension has been common to both classes of patients, medical and surgical, whose average residences some years ago were very different, the mean stay

of the surgical cases being usually four or five days less than that of the medical. If regard be had only to the general mass of surgical patients, it will be found that their mean stay has undergone little variation from the ordinary period, fluctuating from twenty-five to thirty-five days, and that the protracted mean residence is accounted for by a proportionately small number who have been retained in the hospital for a period of many months. The effect of this is seen in the monthly returns of patients who have exceeded a stay of four months in the wards; for while the mean stay of the two classes of patients approximate very closely, there are usually three or four times as many surgical as medical cases who have exceeded the term. In striking the average residence, it was also noticed that while in the course of the year only 3 of the medical cases had a protracted residence over 300 days, 23 of the surgical cases exceeded and in some instances doubled it. The two longest residential periods recorded were 672 and 659 days.

The high mortality which has been noticed for many years in succession has shown no sign of abatement, the death-rate per 100 of the cases treated to a termination having reached 11·39 or nearly 1 per cent. more than in 1875. The increase is mainly attributable to the higher mortality in the medical department, which has shown a death-rate increasing gradually from 14·7 in the year 1872 until it has reached the present high quotation of 17·7 per cent. for 1876; while the deaths in the surgical wards have maintained a mean of from 6 to 7 per cent. for many successive years. The high mortality is only to be accounted for by the system of admitting a larger number of cases of hopeless disease than was formerly the practice, and of retaining them in the hospital till they die.

The wards have been perfectly free from any evil results which might have arisen from contagious disease being brought accidentally into the hospital during the year. The extensive prevalence of two epidemics, smallpox and scarlet fever, has brought many persons suffering from these diseases to the hospital, but in all instances they have been transferred to the custody of the parish officers and sent to the asylums provided by the local government. Several patients who were undergoing treatment for other affections, and who had appa-

rently contracted smallpox or scarlet fever in the hospital, were dealt with in a similar way, and there was no instance of either complaint spreading to other patients or to the employées of the establishment.

There has been rather more than the average number of patients admitted into the wards set apart for traumatic erysipelas and offensive surgical cases. Both wards (male and female) have been continuously occupied, but for a considerable part of the year the ward appropriated for females was free from any malady of a septic or contagious character, and was mainly employed for burns and extensive ulcers and other cases which it was thought desirable not to retain among ordinary surgical cases. In all, 108 patients suffering from erysipelatos and unhealthy wounds were received into the male ward, of which 68 came directly from the outside, while the remaining 40 were brought from other wards of the hospital, where they had either contracted erysipelas or had been admitted with wounds in an unhealthy condition and transferred to the erysipelas ward shortly after admission. Several of the latter series had undergone operations, and 9 of the number died, while of the 68 admitted directly to the ward from the surgery 4 died, 2 from gangrene, 1 from pyæmia, and 1 from cancrum oris. Of the 68 cases admitted for similar affections to the female ward, 41 had their origin outside the hospital, and among these 4 died, while 3 deaths also occurred among the remaining 27 patients who had been transferred from the ordinary wards.

The list of surgical operations contrasts rather unfavorably with the corresponding return for the year 1875, as it presents a diminished number of operations with an increased mortality. This is mainly accounted for by the exclusion of the great bulk of minor operations, such as finger and toe amputations and many others, from the table. On the other hand, the list of ophthalmic operations has undergone a considerable increase from the continuous development of the department.

The table relating to accidents shows a total of 871 cases received into the wards, and these were attended with 83 deaths. The total number, though it presents a decrease amounting to 57 less when compared with the corresponding number for 1875, is higher than the average of the last ten

years; while the death-rate pertaining to it is less than in any year of the decade with the exception of the years 1869 and 1872, when it was noticed to have fallen remarkably low.

Statistical Analysis of the Patients treated in the Hospital during the Year 1876, with Results of Treatment.

Remaining in Hospital 1st January, 1876	569
Admitted during 1876	5,153

Total under treatment 5,722

Discharged as cured	1,511
Relieved	2,664
Unrelieved	435
Died	593
Remaining in Hospital 1st January, 1877	519
	<u>5,722</u>

Average number daily resident throughout the year 550

Mean residence of each, in days, 39·55.

Rate of mortality over all the cases, 11·39 per cent. { Males, 12·27 per cent.
Females, 10·14 „

MEDICAL WARDS.

Remaining 1st January, 1876	252
Admitted during the year	2,136
Total	<u>2,388</u>
Discharged cured	650
Relieved	910
Unrelieved	221
Died	385
Remaining 1st January, 1877	222
	<u>2,388</u>

Average number daily 230

Mean stay of each 39·24 days.

Rate of mortality per cent. { M. 20·70
17·77 { F. 14·85

SURGICAL WARDS.

Remaining 1st January, 1876	317
Admitted during the year	3,017
Total	<u>3,334</u>
Discharged cured	861
Relieved	1,754
Unrelieved	214
Died	208
Remaining 1st January, 1877	297
	<u>3,334</u>

Average number daily 320

Mean stay of each 39·77 days.

Rate of mortality per cent. 6·84 { M. 7·55
F. 5·61

Results of Treatment, distinguishing the Sexes.

Medical wards.						Surgical wards.					
Admitted.		Discharged.		Died.		Admitted.		Discharged.		Died.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1072	1064	858	923	224	161	1933	1084	1786	1043	146	62

Causes of the various Accidents admitted in 1876, with the Mortality attending thereon.

CAUSES OF THE ACCIDENTS.	Total cases.	Discharged		Died.		Remaining.	
		M.	F.	M.	F.	M.	F.
Accidents on the river	39	34	...	4	...	1	...
Assaults	47	28	13	2	...	3	1
Attempts at suicide, excluding poison . .	15	7	4	1	2	1	...
Bites and kicks from animals	14	11	...	3	...	...	...
Burns from clothes taking fire	16	3	3	3	6	...	1
„ heated fluids	11	4	3	1	1	1	1
„ explosion of gas	2	1	1	...	...	...	...
„ explosion of gunpowder	1	1	...	...	...	...	...
Collisions between opposing forces	20	13	1	3	1	1	1
„ with street vehicles	102	57	16	14	3	9	3
Cuts and blows from sharp instruments . .	46	29	13	...	1	1	2
Falls down stairs	52	18	27	1	1	3	2
„ from a height	143	109	9	11	1	13	...
„ on the ground	182	107	53	5	3	13	1
„ of heavy weights	85	72	5	4	...	4	...
Foreign bodies in internal passages . . .	7	5	2	...	...	...	...
Gun-shot wounds	4	3	...	...	...	1	...
Machinery accidents	28	24	1	1	...	2	...
Poisoning, accidental	13	7	5	...	1	...	...
„ intentional	3	1	2	...	...	...	...
Railway accidents	34	20	2	10	...	2	...
Torsions of body	7	6	1	...	...	...	...
Total	871	560	161	63	20	55	12

Table of the Larger Amputations, 1876.

	Total cases.	Ages of cured.		Ages of deaths.		Cured.		Died.		FATAL COMPLICATIONS.
		Males.	Females.	Males.	Females.	M.	F.	M.	F.	
<i>Amputation—Primary, for Injury—</i>										
at hip-joint . . .	1	...	...	21	...	...	...	1	...	Shock.
of thigh . . .	3	...	...	31, 34	52	...	...	2	1	Suppuration, collapse, chloroform.
of leg . . .	4	42	...	44, 60	56	1	...	2	1	Fatty viscera in 2 cases.
at both ankle-joints . . .	1	...	35	...	...	...	1	...	...
at shoulder-joint . . .	1	...	...	25	...	...	...	1	...	
of arm . . .	2	36, 15	...	...	...	2	...	...	...
of forearm . . .	5 {	16, 19, 33, 57	...	48	...	4	...	1	...	Pyæmia.
<i>Amputation—Secondary, for Injury—</i>										
of thigh . . .	1	...	...	24	...	...	...	1	...	Tetanus.
through knee-joint . . .	3	44	...	52	14	1	...	1	1	
of forearm . . .	1	...	...	...	65	...	...	...	...
<i>Amputation for Disease—</i>										
at hip-joint . . .	4	5, 6, 16, 19, 20, 9, 40, 49, 61	...	7, 12	7, 10	...	...	2	2	Collapse and hæmorrhage.
of thigh . . .	17 {	14, 14, 15, 13, 18, 30	14, 18	17, 50, 72	38, 41, 50	9	2	3	3	Lardaceous viscera, phthisis, peritonitis, gangrene of lung, pyæmia 1.
of leg . . .	6	29, 41	...	...	...	3	3	...	...
at ankle-joint . . .	2	4, 15, 18, 21	5	...	...	2	...	...	...
through foot . . .	6 {	59	28	...	22	4	1	...	1	Pyæmia.
of arm . . .	2	...	27	...	...	1	1	...	...
through elbow-joint . . .	1	20, 33, 32, 45	31, 47	...	...	4	2	...	...
of forearm . . .	6 {	...	...	...	...	...	...	...	...
Total . . .	66					31	11	14	10	

	Cured.		Unrelieved.		Dead.		FATAL COMPLICATIONS. When stated.	REMARKS.
	M.	F.	M.	F.	M.	F.		
<i>Excision of Diseased Parts—</i>								
Mammary tumours, cancerous	...	27	...	1	...	4	Erysipelas, abortion	...
" adenocèle	...	2	...	...	...	...	...	...
" encysted	...	4	...	...	...	...	...	...
Cancer of lip	3	...	...	...	1	...	Erysipelas	...
" jaw	...	...	...	...	1	...	...	...
Other cancerous tumours	4	1	...	1	2	...	Pyæmia	...
								Axilla, neck, face, head, and glands.
<i>Other tumours—</i>								
Fibrous	3	2	1	...	...	3	Cancer of brain 1	...
Bursal	3	2	...	...	...	...	...	Jaw 4, leg, malar bone, toe, nose.
Glandular	1	2	...	...	...	...	...	Knee 2, buttock 3.
Fatty	4	5	...	...	...	...	...	Parotid, cervical glands.
Cystic sarcoma	3	...	...	...	2	...	Pneumonia	Neck 2, axilla, thigh, palate.
Bony	...	1	...	...	...	...	...	Exostosis of femur.
Nævus	...	2	...	...	...	...	...	Upper lip, face.
								For varicose veins.
<i>Excision of parts of veins.</i>	1	1	...	...	...	...	...	Malignant tumours.
" testicle	4	...	...	...	...	...	...	For injury.
" eyeball	1	...	...	...	...	...	...	Cancer.
" epulis	...	2	...	...	...	...	...	"
" tongue	3	...	1	...	...	...	...	...
" penis	1	...	1	...	...	...	...	...
" rodent ulcers	2	...	...	...	...	...	...	...

Extraction of foreign bodies	2	...	...	...	...	Cancer, cystitis, pyæmia, cellulitis	Tube from trachea, impacted calculus.
Perineal section	14	...	...	7	...	Septicæmia	Prostatic calculus, &c.
Urethrotomy	2	...	...	1	...	Peritonitis, suppuration of kidneys	Per rectum for stricture.
Lithotomy	5	...	...	4	...	Hæmorrhage, sloughing abscess	Intussusception, old hernia, impracticable labour, ovarian disease.
Tapping bladder	1	...	...	...	...	Diphtheria 2, cancer of larynx	Stricture of rectum.
Ovariectomy	6	...	...	...	6	Pyæmia, bed sore	Both femurs, for anchylosis of hip-joints.
Abdominal section	...	...	...	...	5	Pyæmia, meningitis, brain softening	Sac opened.
Tracheotomy	...	...	...	1	...	Peritonitis 6, gangrene of bowel	" "
Colotomy	...	...	...	...	...	Gangrene of bowel 2	" "
Osteotomy, double	...	...	...	1	...	...	Sac not opened.
Trephining	...	...	...	3	...	Gangrene of lung	Axillary aneurism.
<i>Operations for Hernia—</i>						...	Aneurism and hæmorrhage.
Umbilical	...	...	...	...	2	...	Femoral artery.
Inguinal	4	...	...	9	...	...	Humerus.
Femoral	11	...	...	1	...	...	"
"	2	...	...	...	...	...	"
Radical cure	1	...	...	...	...	...	"
<i>Ligature of Blood-vessels—</i>						...	
Subclavian	...	...	...	1	...	...
Femoral	2	...	...	...	...	...
Hæmorrhoids	2	...	...	...	...	...
Pressure for aneurism	1	...	...	...	...	...
<i>Operations for Ununited Fracture—</i>						...	
Resection of bone	...	...	...	...	...	...
Bones pegged and wired	1	...	...	...	...	...
Subcutaneous section of bone	1	...	...	...	...	...

Surgical Operations, exclusive of Amputations—continued.

	Cured.		Unrelieved.		Dead.		FATAL COMPLICATIONS. When stated.	REMARKS.
	M.	F.	M.	F.	M.	F.		
<i>Reparatory Operations—</i>								
For hare-lip . . .	1	4	..	..	..	..	..	.
" cleft-palate . . .	1	2	..	..	..	..	..
" cicatrized burns . . .	..	2	..	..	..	..	..
" ruptured perineum . . .	..	2	..	..	..	..	..
" vesico-vaginal fistula . . .	..	5	..	..	..	..	..
" occluded rectum . . .	..	1	..	..	..	..	..	Puncture through rectum.
" imperforate anus . . .	..	..	..	..	1	..	..	Artificial anus, right groin.
" congenital deformity . . .	1	..	..	..	..	..	..	Urinary organs.
" injury to face . . .	1	..	..	..	..	..	..	New nose.
" " lip and eyelids . . .	1	..	..	1	..	..	..	Talipes equinus and varus.
Tenotomy . . .	3	..	..	..	..	..	..
Total . . .	131	123	10	6	42	28		

Operations on the Eye.

Compiled by Mr. T. R. JUDSON, Ophthalmic Dresser.)

OPERATIONS.	EYE.			RESULT.			TOTAL. Operations.
	Right.	Left.	Both.	Cured.	Im- proved.	Not stated.	
Removal of tumour from—							
Orbit	10	6	...	10	2	4	16
Cornea	1	1	1	1	2	1	4
Conjunctiva	1	2	...	1	1	1	3
Iris . . . .	...	2	...	1	...	1	2
EYELIDS—							
Ectropion	1	3	6	4	6	6	16
Entropion	5	3	1	2	1	7	10
Enlargement of palpe- bral aperture	5	2	2	1	2	8	11
Diminution of ditto	4	3	...	1	2	4	7
Trichiasis	4	1	2	1	2	6	9
Pterygium	1	...	...	1	...	...	1
Removal of epithelioma	3	2	...	2	...	3	5
LACHRYMAL APPARATUS—							
Opening lachrymal sac	2	1	2	3	1	3	7
Obstruction of nasal duct (congenital) . . . .	...	...	1	2	...	...	2
EXTERNAL MUSCLES OF EYEBALL—							
Operation for—							
Convergent strabismus	12	19	40	2	...	109	111
Divergent „	3	2	3	1	...	10	11
CORNEA—							
Removal of opacity by tinting	5	4	...	...	9	...	9
Removal of foreign body	3	1	...	1	3	...	4
Incision for suppuration	2	2	...	...	2	2	4
Operation for conical cornea	1	...	...	1	...	...	1
Operation by inoculation	...	...	2	4	...	...	4
SCLEROTIC—							
Sclerotic incision for glaucoma	17	21	20	3	37	38	78
IRIS—							
Iridectomy for—							
Artificial pupil	78	72	107	48	114	202	364
Prolapse of iris	3	2	...	...	5	...	5
Glaucoma	6	7	10	5	10	18	33
Ulceration, threaten- ing perforation of cornea	4	7	3	...	6	...	17
Removal of entire iris	1	1	...	...	...	2	2

Operations on the Eye—continued.

OPERATIONS.	EYE.			RESULT.			TOTAL. Opera- tions.
	Right.	Left.	Both.	Cured.	Im- proved.	Not stated.	
IRIS (continued)—							
Iridodectomy for artificial pupil	1	...	...	1	...	...	1
CRYSTALLINE LENS—							
Common extraction	56	42	25	80	21	47	148
Extraction with iridec- tomy	13	12	5	16	6	13	35
Needle operation	6	1	10	5	12	10	27
Removal by suction	1	...	...	1	...	...	1
„ by scoop	3	1	...	1	...	3	4
„ of opaque cap- sule	19	5	3	2	7	21	30
EYEBALL—							
Operation for staphyloma	6	3	1	...	11	...	11
Abscission	3	1	...	...	4	...	4
Excision	18	17	...	...	35	...	35
	298	246	244	201	301	519	1032

Many more operations have been performed during the year, but having been done on out-patients, were not recorded in the book.

Minor operations, such as slitting up canaliculi, removing tarsal tumours, &c., are not recorded.

The imperfect registration of results is due to the fact, that most of those operated on are either at the time out-patients or become so shortly after the operation.

The operations on both eyes are considered as two operations.

OUT-PATIENT DEPARTMENT, 1876.

The following numbers comprise such patients as were furnished with cards and prescription papers to enable them to continue their attendance at the Hospital for a period of eight weeks:—

	Males.		Females.		Total.
Ordinary medical cases	1,626	.....	1,639	.....	3,265
Ordinary surgical cases	1,909	.....	1,596	.....	3,505
Diseases peculiar to women . . . . .	...	.....	1,902	.....	1,902
Diseases of the eyes	1,409	.....	1,843	.....	3,252
Diseases of the skin	432	.....	533	.....	985
Diseases of the ear	561	.....	690	.....	1,251
	5,957	.....	8,203	.....	14,160

Besides the above there were registered and prescribed for, in the rooms devoted to the out-patients, by the house-physicians and surgical dressers under the supervision of the staff:—

	Males.	Females.	Total.
Medical cases . . .	2,811	4,202	7,013
Surgical cases . . .	20,093	18,556	38,649

The number of minor accidents and other urgent cases attended to in the surgery by the house-surgeons and dressers amounted to 11,005—of which 7,977 were males and 3,028 were females.

The dental cases attended to in the surgery were 2,783, of which 1,222 were males and 1,561 were women and children.

The number of women confined at their own homes through the agency of the Lying-in Charity amounted to 2,449.

DETAILS OF MIDWIFERY DEPARTMENT.

Number of women confined during the year . . .	2,449
Number of single births, 2,420; twins, 29. Total children . . .	2,478
Living male children . . .	1,245
Living female children . . .	1,123
Stillborn males . . .	66
Stillborn females . . .	44
	—2,478

Of the 2,478 children, 2,368 presented naturally at birth, 52 were breech presentations, 11 were face, 22 were footling, 21 hand and arm, 3 were placental, and 1 was a funis presentation.

Version was had recourse to in 13 cases, the forceps were employed 27 times, craniotomy was performed twice, and Cæsarean section once.

The deaths were 13 in number and were attributed to the following causes:—6 to septicæmia or puerperal fever, 2 to bronchitis, and 1 to each of the following causes: hæmorrhage, peritonitis, placenta prævia, craniotomy, and Cæsarean section.

Among the mothers there were in their

1st confinement . . .	351	Brought forward . . .	2,275
2nd „ . . .	331	10th confinement . . .	78
3rd „ . . .	368	11th „ . . .	49
4th „ . . .	312	12th „ . . .	19
5th „ . . .	275	13th „ . . .	15
6th „ . . .	210	14th „ . . .	7
7th „ . . .	184	15th „ . . .	3
8th „ . . .	120	16th „ . . .	2
9th „ . . .	124	17th „ . . .	1
	2,275	Total . . .	2,449

RETROSPECTIVE SUMMARY OF PATIENTS RELIEVED DURING
THE YEAR 1876.

	Male.		Female.		Total.
Patients under treatment in the wards .	3,306	...	2,416	...	5,722
Out-patients—Surgical, ordinary .	1,909	...	1,596	...	3,505
„ Medical, ordinary .	1,626	...	1,639	...	3,265
„ Diseases of women .	...	...	1,902	...	1,902
„ Diseases of the eyes .	1,409	...	1,843	...	3,252
„ Diseases of the ear .	561	...	690	...	1,251
„ Diseases of the skin .	452	...	533	...	985
„ Medical casual or slight cases	2,811	...	4,202	...	7,013
„ Surgical casual or slight cases	20,093	...	18,556	...	38,649
„ Minor accidents or sur- gery cases . . .	7,977	...	3,028	...	11,005
„ Tooth extractions .	1,222	...	1,561	...	2,783
„ Midwifery patients .	...	...	2,449	...	2,449
Total .	41,366	...	40,415	...	81,781

Retrospective Summary of all the Patients Treated in Guy's Hospital since 1867.

	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.
IN-PATIENTS.										
Under treatment during the year . . .	5,245	5,297	5,164	5,123	5,549	5,828	5,571	5,776	5,854	5,722
Discharged well or convalescent . . .	2,109	2,237	1,082	1,673	1,832	1,741	1,400	1,354	854	1,511
Relieved	1,532	1,551	2,047	2,057	2,203	2,634	2,749	2,925	3,452	2,664
Unrelieved	483	411	470	396	422	451	341	334	419	435
Discharged for special reasons . . .	146	116	...	...	...	...	...	...	...	...
Died	509	466	496	498	555	471	524	594	560	593
Rate of mortality per cent.	10.65	9.72	10.56	10.76	11.07	8.89	10.44	11.40	10.60	11.39
Average number daily resident . . .	502	498	487	486	529	556	558	550	559	550
Mean residence of each in days . . .	34.93	34.31	34.42	36.92	37.58	37.73	39.88	38.68	37.32	39.55
Number of accident cases admitted . .	911	805	788	821	892	938	885	852	928	871
Number of deaths from accident . . .	101	83	76	91	85	66	85	102	95	83
Number of ordinary operations registered	362	417	314	345	316	309	350	540	452	406
Number of deaths after operations . .	69	70	51	63	76	60	73	104	75	94
Number of ophthalmic operations . . .	638	624	499	441	678	722	671	470	631	1,032
OUT-PATIENTS.										
Surgical cases	4,125	3,905	3,655	3,350	3,883	3,813	3,681	3,801	3,313	3,505
Medical cases	3,438	3,456	3,380	3,330	3,216	3,132	3,126	2,919	2,987	3,265
Diseases of the eyes	2,914	3,614	3,775	3,580	3,657	3,392	3,356	3,083	2,717	3,252
Diseases peculiar to women	1,736	1,675	1,708	1,827	1,740	1,719	1,719	1,644	1,745	1,902
Diseases of the skin	801	1,048	1,047	1,055	1,089	1,034	994	989	1,170	985
Diseases of the ear	757	960	913	929	1,262	1,467	1,332	1,089	990	1,251
Casual or minor medical cases. . . .	10,414	10,679	11,152	11,086	10,416	10,308	8,532	7,042	7,143	7,013
Casual or minor surgical cases. . . .	37,985	41,159	38,820	38,134	37,797	39,135	41,670	43,573	41,363	38,649
Tooth extractions	4,748	3,655	1,976	2,589	1,955	2,330	2,204	3,758	2,278	2,783
Minor accidents	6,444	6,390	7,319	8,585	5,804	7,506	10,770	14,746	9,764	11,005
Women confined at their own homes .	1,727	1,783	1,929	2,183	2,240	2,518	2,213	2,449	2,334	2,449
Number of deaths after confinement .	4	8	5	10	8	7	16	17	9	13

DESCRIPTION OF PLATES,

Representing the splints employed by Mr. Howse for Excision of the Knee and of the Ankle.

PLATE I.

FIG. 1.—Represents the splint prepared for excision of the knee in the case of a child. It consists of a tinned iron trough for the thigh and another for the leg joined by a posterior bar (z). This bar is from four to six inches long in accordance with the size and age of the patient operated upon. It is made convex from side to side to avoid cutting into the popliteal space, and really consists of two bars sliding upon each other (though this could not be shown in the drawing) and clamped very firmly by two nut screws, so that no movement is permitted between them. This arrangement is adopted so as to increase the length of the interruption at the time of the operation, if occasion should arise for it. The foot-piece, x (represented rather too short), has a notch cut in it to suspend the foot over, in case of any soreness developing itself about the heel.

FIG. 2.—Represents the limb arranged after the operation of excision.

A. The mattress.

B. A water-bed.

C. Pipe (two feet long) for filling the same after the patient has been placed on it.

D D. A waxed bandage rolled round the thigh and leg pieces.

E. Strapping around the leg and foot designed to support the heel by the longitudinal band seen above E.

K. A piece of tape looped into the above-mentioned longitudinal band, and tied over the hook. This band commonly is tied over the notch in the foot-piece, which in this patient was made too short, so it had to be fixed in the manner represented.

H. A rotatory band tied loosely so as to support the splint and yet permit its rotation, if the patient should turn accidentally upon his side.

F. Portion of the limb exposed, corresponding to the excision wound.

G. Pillow for the opposite limb to rest on.

PLATE II.

FIG. 1.—Represents a limb dressed after excision of the ankle.

A A. The splint, covered with bandages at A' A'.

B. A rod, carrying a pulley at the end, capable of being moved up or down A', so that it may be fixed in the axis of the leg.

C. A bent bar of iron attached above to the splint at D and D' (see Fig. 3), carrying two pulleys below at E E and E' E' round which the cord F runs. This cord is also carried round the traversing wheel G. This arrangement is to permit the free rotation of the leg.

FIG. 2.—Represents an enlarged view of the traversing wheel G.

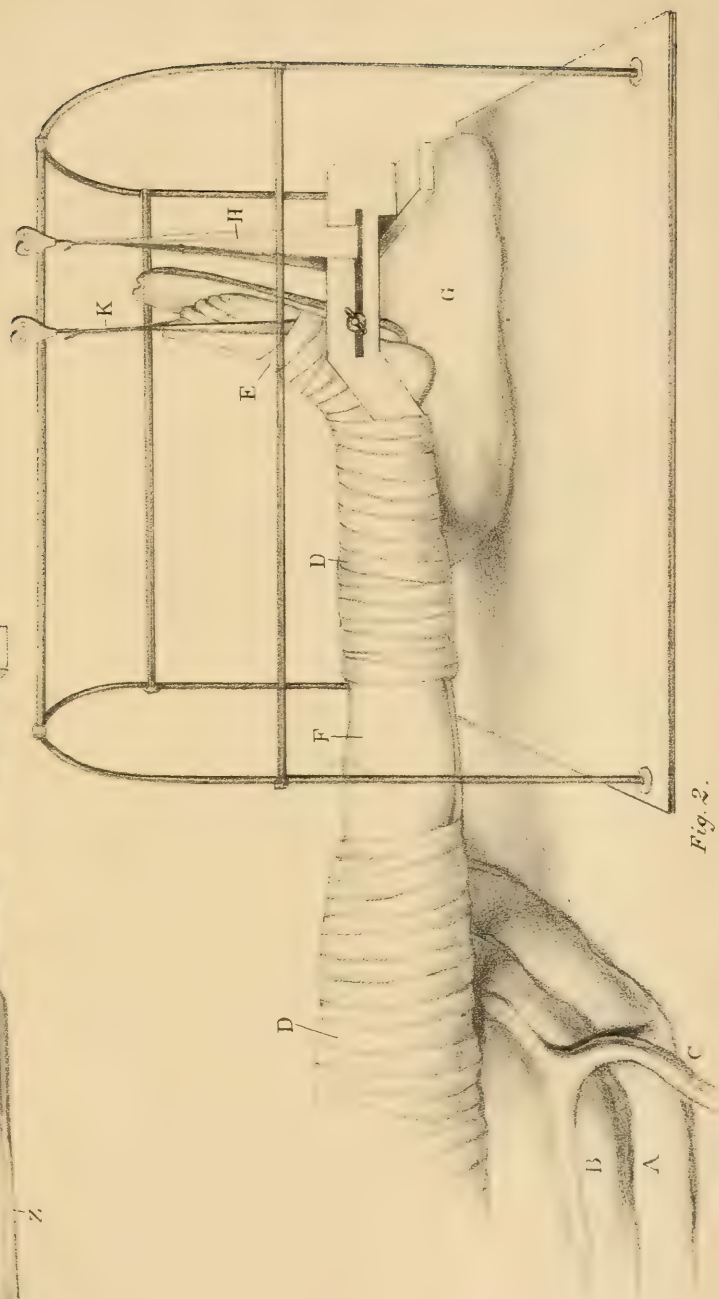
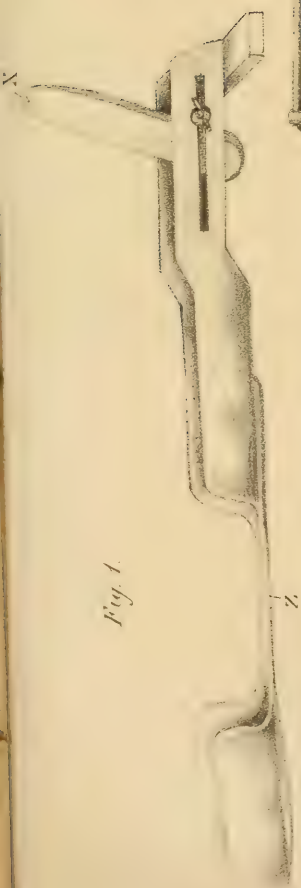




Fig. 1

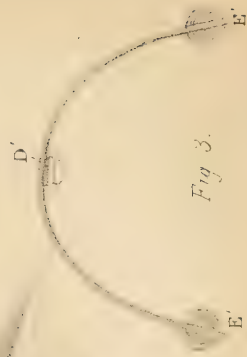


Fig. 3.

Hanhart imp.

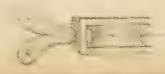


Fig. 2

W. H. H. H.

SHORT COMMUNICATIONS.

SPLINT FOR EXCISION OF THE KNEE.—Having been frequently asked what arrangements I now adopt for this operation, I have had drawn the splint and bed arrangements in the accompanying plate. All my operations having been performed antiseptically, I have found the following things necessary: (1.) That the splint should be such as to permit the wound to be dressed without disturbing the parts. (2.) That the permanent bandages above and below the wound should be watertight so as not to get wetted with the spray. (3.) That it should be possible to lift the heel from the splint in case of a sore forming. (4.) That the splint and limb should be capable of rotating *en masse* if the patient turns on his side. (This is especially important in case of children.)

The accompanying plate will explain how all these requirements are fulfilled. It is to be noted, however, that in the case from which this diagram was taken rotation of the limb would have been prevented by the band (κ). This must be regarded as unusual, and only adopted in this case on account of the shortness of the footpiece.

The waxed bandages are now applied *cold*, and are prepared by passing rollers through a mixture of ordinary yellow wax and olive oil, in proportions sufficient to make the wax soft and workable. After they have been applied to the limb they are painted over with a little hot wax mixture, so as to make them weld into one mass. Any spaces between the limb, splint, and the bandages above and below the interval (ρ) are filled with cotton-wool, soaked in some of the hot wax mixture. By

this means the lotion and discharges are prevented gravitating up the thigh.

The wax mixture adopted above is the result of very many experiments, and is by far the most satisfactory of all the methods tried. The bandage applied cold is easily manipulated, and gets a certain amount of adhesion to the skin which causes the whole limb and splint to move *en masse*, if the patient should turn or toss about. It is infinitely better than the paraffin or plaster-of-Paris bandage.

In some of the latest splints, especially for children, we have adopted, in place of the rotating band (H), two wheels, one in place of the hook above, the second attached to the splint, so that its centre of motion corresponds to the axis of the leg. These wheels, connected by a cord, permit very perfect rotation.

H. G. HOWSE, M.S.

SPLINT FOR EXCISION OF THE ANKLE.—It is a difficult thing to get a satisfactory splint for this operation, when it is desired to keep the wound antiseptic. After many experiments I have at length adopted the splint shown in the accompanying drawing (Plate II). It is constructed on the principle of an ordinary anterior splint and consists of a bar of iron about $\frac{5}{8}$ ths inch wide bent to fit the shape of the anterior part of the leg and foot. It runs from just below the knee to the sole of the foot and is represented on the diagram by the line AA, and (underneath the bandage) by the dotted line A'A'.

This splint is fixed to the front part of the leg and to the foot by strapping. The best plan of doing this is by fixing a longitudinal band of macintosh strapping to the front and back of the leg, carrying it over the sole and dorsum of the foot in the form of a loop at the toes, just as in excision of the knee-joint, for taking pressure off the heel. This loop is then tightly tied to the bend of the iron splint just above the toes. A few circular turns of plaster and a bandage render this arrangement perfectly secure from slipping. The longitudinal band should be cut extremely narrow opposite the excision wounds, so as to interfere as little as possible with the antiseptic dressings.

Although this splint answers very well in permitting the antiseptic dressings to be applied without disturbing the limb, and in allowing rotation of the limb, it is probable that we may still further modify the arrangements of the upper end (shown in Plate II, fig. 3), which are rather complicated, by substituting for them a broad band of leather, fastened to the bandage, behind the leg, and attached by either end to the cord passing through the rotating traversing wheel (g).

The cradles both for this operation and for excision of the knee are now made with a second horizontal bar above the traversing wheels (g), so as to take the weight of the bed-clothes off the wheels, and permit their free movement.

H. G. HOWSE, M.S.

ON THE TRANSLUCENCY OF CERTAIN FORMS OF HERNIA IN CHILDREN.—It does not seem to be generally known that the test of translucency *by itself* is not sufficient to distinguish a hydrocele from a hernia in very young children. I have on several occasions found a congenital hernia, when the bowel was only filled with flatus, to be exceedingly translucent. This point seems to be of importance, as it is generally taught that translucency is diagnostic of hydrocele. If this dogma were acted on in very young children, in some cases the practitioner might put a trocar into the bowel. Surgeons, however, do not generally resort to this test alone to distinguish between a hernia and a hydrocele in children. Hence, this accident is not one very likely to take place. The only case which I have known, in which the risk was considerable, was one in which a congenital hernia in a child got strangulated. I saw the case before the abdominal symptoms of strangulation had developed themselves and found perfect translucency. It was proposed to me to tap the swelling, but I advised the administration of chloroform, and the whole of the supposed hydrocele went up with a gurgling sound into the abdomen. In this case the recognition of the fact undoubtedly saved the patient from having the bowel punctured.

H. G. HOWSE, M.S.

ON THE USE OF CARBOLIC ACID IN SURGICAL DRESSINGS.—At page 330 of the present volume Mr. Bryant asks surgeons “to observe their patients closely when using carbolic acid as a dressing to wounds,” as he had found “great nervous depression and semi-unconsciousness to be a direct consequence of its use.” Having in the course of the last seven years used carbolic acid lotion to nearly every case in which it was possible to apply an antiseptic dressing, I wish to record how very different my experience has been from that above quoted. During the whole of this period I have not had a single case which I could fairly call a case of *poisoning* by carbolic acid. I have had cases of black urine; they have, however, been few in number, and not attended with any constitutional state which could be considered referable to the carbolic acid. In all I have steadily continued the treatment and the black urine has speedily disappeared, sometimes in the course of a few hours, sometimes in a day or two. The question which I always ask on seeing black urine after the use of carbolic acid is—“What is the state of the urine as regards albumen?” If there is none I disregard it, and as I have not yet found it in any of my cases, I have never altered the dressings. If there was albumen, I certainly think I should alter the treatment. Three or four years ago I saw a case in the practice of one of my colleagues in which even weak carbolic oil appeared to produce black urine *and albuminuria*. In this case the alteration of the dressings was followed by an immediate amelioration. This, however, is the only case I have seen out of many thousands in which I have employed this agent. Probably here we had some curious idiosyncrasy, or some weakness of the kidneys, which rendered the patient peculiarly susceptible to its use.

It is, however, to be observed that I never make use of the acid in anything like the strength which Mr. Bryant seems to have employed. Thus, in the case of the boy, aged seven (p. 330), although he speaks of the solution having been “weak,” yet he states that it was 10 per cent. Now, water will only dissolve about one twentieth of its weight of the pure carbolic acid. This lotion then must have been prepared with glycerine or spirit, both of which render carbolic acid more soluble in water. The ordinary strength of the lotion I use

in the wards is one in forty. The lotion employed by Mr. Bryant was, therefore, just four times the strength that I ordinarily employ.

Again, he mentions the case of a middle-aged man (p. 329), in whom "a small wound of the head was dressed with carbolic oil (20 per cent. strength)," who, after the first dressing, "became frightfully depressed, collapsed, and unconscious." The strength of carbolic oil ordinarily employed in my wards is one in twenty. Mr. Bryant employed a strength of one in five, *i. e.*, just four times the strength which I employ. The toxic symptoms in these cases may, therefore, be very reasonably explained by the greater strength of the acid used.

I regard carbolic acid as of such extreme importance in the treatment of our cases that I cannot but record this experience of mine in reply to the request which he has made.

H. G. HOWSE, M.S.

SEQUEL OF A CASE OF PULSATION OF THE LIVER.—In the twentieth volume of these Reports I contributed a paper on "Pulsation of the Liver," in which five well-marked cases were recorded. Two of these cases had terminated fatally and the post-mortem results were appended. The other three patients have all been more or less under observation since that time; one of them, Charles .H— (Case 3), died in the hospital in August, 1876. His case is described at p. 387 of the above-mentioned volume, and is briefly as follows:

. He was aged 20 when first admitted in May, 1874, with symptoms of heart disease. He had never had rheumatism, but had suffered from shortness of breath for five years, and the last seven weeks had noticed cough and swelling of the feet. The heart was large, and presented at the apex a loud systolic murmur accompanied by thrill; the murmur was also audible in the axilla and back. The liver was much enlarged and pulsated strongly over the whole of its exposed surface. Subsequently a short diastolic apex murmur became evident. The date of the last note is January 20th, 1875, but he remained in the hospital until April 21st, 1876, with no essential alteration in his symptoms. After a fortnight's

absence he was again admitted with increased cardiac symptoms, and the following day was taken with sudden right hemiplegia and partial aphasia. From this attack he quickly recovered, but it was repeated on June 3rd, and again on August 7th, this time with a fatal result.

Post mortem.—The body was well nourished, and there was but little œdema of the legs. The brain presented on the under surface of the right lobe of the cerebellum an ill-defined, superficial patch of yellowish-white softening; elsewhere it appeared healthy. The lungs were affected in a marked degree with brown induration, and the branches of the pulmonary artery were thickened and indurated. All the cavities of the heart, with the exception of the left ventricle, were much enlarged. The right ventricle was dilated, and its walls were crisp and hard. The left auricle was rather thickened, and its lining membrane opaque. The mitral orifice was narrowed to a most extreme degree, so that not even the tip of the finger would penetrate it; it was very thick and opaque, and the chordæ tendineæ were adherent together. There were no vegetations upon it. The liver was much indurated, and its capsule opaque. Its cut surface was intersected by lines of white fibrous tissue, and its secreting substance was much diminished in quantity and broken up into separate nodules. The branches of the hepatic vein were much dilated. Both the spleen and the kidneys contained embolic patches, and the capsule of the former was opaque.

The points of interest in relation to hepatic pulsation are the dilatation and hypertrophy of the right ventricle, the large size of the tricuspid orifice, the cirrhosis, thickened capsule, and dilated veins of the liver. It may be observed that in one of the fatal cases alluded to above the fibrous tissue of the liver was abundant and the veins moderately dilated, while in the other the organ was soft and its veins scarcely at all enlarged.

FREDERICK TAYLOR, M.D.

L I S T

OF

GENTLEMEN EDUCATED AT GUY'S HOSPITAL

WHO HAVE PASSED THE

EXAMINATIONS OF THE SEVERAL UNIVERSITIES, COLLEGES,

&c., &c.,

IN THE YEAR 1876.¹

University of Cambridge.

Degree of Doctor of Medicine.

D. B. Lees.

Final Examination for the degree of Bachelor of Medicine.

E. Amphlett, M.A.		T. L. Porter, B.A.
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Second Examination for the degree of Bachelor of Medicine.

E. C. Beale.		R. S. Taylor.
R. A. Birdwood.	|	C. L. Jones.

University of London.

Final Examination for the degree of Bachelor of Medicine.

First Division.

J. C. Ferrier.

Obtained First-Class Honours in Medicine and First-Class Honours in Obstetric Medicine.

A. H. Jones.

Obtained First-Class Honours in Obstetric Medicine, First-Class Honours in Forensic Medicine, and Honours in Medicine.

¹ The Editors will thank past and present Students of Guy's Hospital for any information as to Degrees, Diplomas, or Honours obtained by them during the current year (1877).

510 *Gentlemen admitted to Degrees, &c., in the year 1876.*

W. A. Kidd.

Obtained the Gold Medal in Forensic Medicine and Honours in Medicine and Obstetric Medicine.

W. H. Lamb.

Obtained Honours in Obstetric Medicine.

Second Division.

H. Duke.

Obtained Honours in Obstetric Medicine.

Examination for the degree of Bachelor of Surgery.

Second Division.

W. A. Kidd.

First Examination for the degree of Bachelor of Medicine.

First Division.

J. C. Uthoff.

Obtained the Gold Medal in Organic Chemistry, Materia Medica, and Pharmaceutical Chemistry, and Honours in Physiology, Histology, and Comparative Anatomy.

R. S. Wainewright.

Second Division.

F. H. Berry.

Obtained Honours in Organic Chemistry, Materia Medica, and Pharmaceutical Chemistry.

G. Mackern.

Obtained Honours in Physiology, Histology, and Comparative Anatomy.

H. L. Manby.

T. S. Sheldon.

G. H. Russell.

Excluding Physiology.

First Division.

J. W. Meek.

Preliminary Scientific M.B. Examination.

First Division.

B. N. Rake.

Obtained Honours in Chemistry.

F. T. Bayes.

Second Division.

J. I. Boswell.

W. E. Fielden.

G. R. Marsh.

R. A. Milligan.

University of Edinburgh.

First Professional Examination.

T. Richards.

University of Aberdeen.

Promotion to the degree of Doctor of Medicine.

C. E. Barnard.

Final Examination for the degree of Bachelor of Medicine.

E. O. Giblin.	|	W. C. James.
	C. Seymour.	

First Examination for the degree of Bachelor of Medicine.

H. Bartlett.	|	A. H. Burton.
A. D. Brenchley.	|	T. W. Richards.
	L. Rudd.	

Examination for the degree of Master in Surgery.

E. O. Giblin.	|	W. C. James.
	C. Seymour.	

Indian Medical Service.

P. A. Weir, M.A., M.B., C.M., 5536 marks, Netley.

Obtained the Herbert Prize.

Army Medical Service.

August.

E. O. Reynolds, 1935 marks.

Obtained the fourth place at the Examination.

J. T. Carey, M.B., 1925 marks.

Obtained the fifth place at the Examination.

H. Cotton, 1230 marks.

Navy Medical Service.

J. T. W. S. Kellard, 3150 marks.

Obtained the sixth place at the Examination.

Royal College of Physicians, London.

Examination for the Membership.

E. Burrell, M.D.		A. Sangster, M.B.
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Examination for the Licence.

February.

A. de W. Baker.		A. G. Lacy.
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April.

H. C. Burton.		C. E. Winckworth.
J. J. Newman.		St. C. B. Shadwell.

July.

A. L. Bowen.

December.

J. W. Bull.	|	A. W. Green.
	C. Gross.	

Royal College of Surgeons.

Final Examination for the Fellowship.

H. Brietzcke.¹

W. J. Tyson.

T. D. Ransford.

First Examination for the Fellowship.

J. W. Smith.¹
J. Mackern.
W. Lane.
J. C. Uhthoff.

R. S. Wainewright.
W. E. Paley.
C. G. W. Lowdell.

J. Poland.
G. A. Wright, B.A.
J. St. T. Clarke, M.B.

Final Examination for the Membership.

January.

W. C. James, M.B.
G. R. Chadwick.
H. L. Champneys.
A. Finch.
E. Duke.

G. Mackern.
R. R. W. Oram.
J. Johnson, M.B.
H. Wright.
J. McC. McCarthy.

T. A. McCullagh.
C. T. Alexander.
J. R. Burton.
W. Phelps.
F. G. A. Rogers.

April.

J. W. Bull.
T. R. Judson.

A. G. Barrs, M.B.
E. Bowen.

F. A. Hyne.

May.

F. C. Coley.
C. G. Lee.
T. L. Porter, B.A.
C. Seymour, M.B.

W. D. Stamp.
H. P. Welchman.
D. F. Walker.

C. A. G. Barrow.
C. F. Pickering.
W. P. Turner.

July.

E. J. Donbavand.
W. M. Evans.
T. Jones.
J. T. Brett.
J. Davies.
C. W. Lacey.
W. P. Reynolds.

T. A. Richardson.
T. K. Fell.
C. Gross.
J. C. Irving.
W. Strover.
O. T. Slatter.
J. Todd.

T. Duke, M.A.
E. G. Dutton.
W. Gibson.
R. Bevan.
B. W. Gathergood.
A. J. Rowbotham.
L. H. Stevenson.

November.

T. F. I. Blaker.
W. H. Coates.
W. E. Dring.

D. Elcum.
E. F. Ingram.
J. A. Masters.

T. F. Pedley.
E. A. H. Herbert.

First Examination for the Membership.

January.

J. Johnson, M.B.
F. B. Maclean.
E. R. Mansell.
R. S. Taylor.

A. E. Chesshire.
W. Gibson.
H. A. Baber
J. H. Earle.

C. Gross.
G. H. Parry.
W. H. Puddicombe.
J. K. Womersley.

¹ This name was accidentally omitted from the list in the last volume.

April.

G. B. W. Messum.	R. Parry.	R. J. Bryden.
J. F. Tabb.	J. G. S. Lewis.	J. R. Harris.
T. W. Fuller.	H. O. Stuart.	W. D. Hartley.
M. J. Hart.	H. L. Bates.	R. W. White.
A. E. Maylard.	E. W. Deare.	C. Wood.
E. J. Morley.	R. A. Ross.	

May.

O. Griffiths.	J. Osborne.	R. A. H. Hart.
A. B. Hammond.	L. W. Reynolds.	W. G. G. Parker.
A. G. Wells.	H. H. Bovill.	J. Alexander.
J. Brock.	J. F. Briscoe.	F. W. Apthorp.
M. F. Cock.	H. C. Burdett.	J. Codner.
J. Davies.	W. J. Coles.	E. A. Jones.
E. Penny.	R. F. Cox.	G. F. Symons.
J. G. Graveley.	G. F. Crooke.	H. E. Walker.

July.

F. B. J. Baldwin.	C. A. Everest.
W. A. Phillipps.	S. V. Theed.

Examination for the Licence in Dental Surgery.

T. A. Roberts.

Apothecaries' Society.

Final Examination for the Licence.

December, 1875.

J. F. Dell.	J. W. B. Mason.
J. A. H. Budgett.	

January, 1876.

H. W. Roberts.

February.

J. F. Breach.	A. M. Turner.
J. Todd.	

March.

E. G. Dutton.	T. L. Porter, B.A.
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April.

F. A. Hyne.	W. Strover.
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May.

H. Hetley, M.B.	J. C. Ferrier, M.B.
C. Seymour.	

June.

T. F. I. Blaker.	E. Duke.
J. J. W. Grimwood.	J. Morgan.

July.

J. McC. McCarthy.	J. T. Roberts.
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514 *Gentlemen admitted to Practice, &c., in the year 1876.*

	August.	
W. Dunstan.		J. C. Keer.
	October.	
R. Lee.	|	T. Richards.
	November.	
T. A. Richardson.	|	J. Hammersley.
O. Bowen.	|	T. F. Pedley.
	W. E. Dring.	
	December.	
G. H. Parry.	|	E. R. Mansell.
W. H. L. Welchman.	|	A. H. Jones, M.B.

First Examination for the Licence.

	December, 1875.	
A. C. Morton.	|	J. Reader.
	T. F. Pedley.	
	January, 1876.	
	J. T. Roberts.	
	February.	
J. H. Poland.	|	J. Hammersley.
	March.	
R. Lee.	|	J. W. Meek.
	J. C. Keer.	
	April.	
T. F. I. Blaker.	|	J. H. Earle.
	G. H. Parry.	
	May.	
	E. R. Mansell.	
	June.	
W. Dunstan.	|	V. A. Jaynes.
	July.	
W. F. Hearnden.	|	Thos. Dutton.
	August.	
A. B. Hammond.	|	A. G. Wells.
	September.	
	H. P. Welchman.	
	October.	
	T. A. Richardson.	
	November.	
H. O. Stuart.	|	R. J. Bryden.
L. W. Reynolds.	|	R. L. Lawson.
	December.	
B. F. Giles.	|	A. Pain.
	J. Osborne.	

GUY'S HOSPITAL MEDALLISTS AND PRIZEMEN, 1875-76.

EXAMINATION OF THE STUDENTS IN MEDICINE AND ITS
ALLIED SCIENCES, AUGUST, 1876.

The Treasurer's Gold Medal for Medicine.

William Percy Reynolds, Norwood.

The Treasurer's Gold Medal for Surgery.

Richard Bevan, Redruth, Cornwall.

Proxime accessit—W. P. Reynolds, Norwood.

Third Year's Students.

George Arthur Wright, B.A., Vange, Essex, First Prize, £40.

Peter Horrocks, Over-Darwen, Lancashire, Second Prize, £35.

James Harry Poland, Blackheath, Certificate.

Charles Gross, Erith, Kent, Certificate.

Second Year's Students.

Edward John Morley, Blackburn, Lancashire, First Prize, £35.

Gordon B. W. Messum, Dulwich, Second Prize, £30.

Henry Ogilvy Stuart, Woolwich, Certificate.

Richard Joseph Bryden, Uffculme, Devon, Certificate.

William Alfred Phillipps, New Cross, Certificate.

William Darley Hartley, Crewe, Cheshire, Certificate.

Richard Watts White, Blakeney, Gloucester, Certificate.

First Year's Students.

Leonard Charles Wooldridge, Brixton, First Prize, £50.

William Hale White, Carshalton, Surrey, Second Prize, £25.

Frederick Felix Jones, Llanfyllin, Montgomeryshire, £10 10s. (*Presented
by one of the Governors.*)

John Siddon Crook, Northfleet, Kent, Certificate.

William Whitworth, St. Agnes, Cornwall, Certificate.

Jas. Thos. Brett, Watford, Herts, Certificate.

Harold Edward B. Flanagan, Woolwich, Certificate.

Joseph Hodgson, Chadd, Bedfordshire, Certificate.

Henry Hinds Austin, Borough, London, Certificate.

ENTRANCE EXAMINATION IN CLASSICS, MATHEMATICS, AND
NATURAL SCIENCE, OCTOBER, 1876.

William Eckett Fielden, Forest Dene, Walthamstow, First Prize, £60.

John William Nicholson, Alstone, Cheltenham, Second Prize, £30.

Robert Arthur Milligan, Deare, Kimbolton, Certificate.

Edgar Elliott, Cudnell, Wimborne, Certificate.

Pupils' Physical Society.*Session 1876-77.***Honorary President.—Dr. WILKS.****Presidents.**

Messrs. J. T. Brett, R. E. Carrington, F. C. Coley, H. Davy, E. Duke, D. Elcum, B. W. Gathergood, J. T. Hinton, A. H. Jones, M.B., W. A. Kidd, M.B., H. F. Lancaster, W. Lane, C. G. Lee, M. Lubbock, G. Mackern, J. Morgan, W. P. Reynolds, St. C. B. Shadwell, and C. J. Symonds.

Honorary Secretaries.—F. TAYLOR, M.D.; R. CLEMENT LUCAS, B.S.

PRIZEMEN FOR THE SESSION 1875-76.

Mr. J. T. Hinton, £10, for his Paper, "Some Methods of Treating Fractures," read before the Society.

Mr. J. Talbot Brett, £5, for his Paper on "Expression as an Index to Disease," read before the Society.

Mr. W. Lane, £5, as the Member who had distinguished himself most in the Debates of the Session.

CLINICAL APPOINTMENTS HELD IN THE YEAR 1876.**RESIDENT HOUSE PHYSICIANS.**

J. Rendall.	W. J. Tyson.
J. M. Hobson.	H. F. Lancaster.
H. N. Smith.	M. Lubbock.

RESIDENT HOUSE SURGEONS.

H. Clarke.	R. E. Carrington.
A. H. Jones, M.B.	E. Amphlett, M.A., M.B.
C. J. Symonds.	H. N. Smith.

RESIDENT OBSTETRIC ASSISTANTS.

W. J. Tyson.	H. L. Champneys.	F. C. Coley.
C. J. Symonds.	A. de W. Baker.	St. C. B. Shadwell.
R. E. Carrington.	J. W. Bull.	F. W. R. Romano.
E. Amphlett, M.B.	M. Lubbock.	H. F. Lancaster.

SURGEONS' DRESSERS.

J. T. Brett.	L. H. Stevenson.	J. C. Wilkinson.
W. P. Reynolds.	T. F. Pedley.	C. W. Lacey.
W. H. L. Welchman.	A. M. Turner.	W. C. James, M.B.
D. Elcum.	J. T. Gardner.	P. Horrocks.
R. Bevan.	W. M. Evans.	C. T. K. Shaw.
B. W. Gathergood.	J. Mackern.	J. T. Hinton.
C. F. Pickering.	H. W. Ewen.	A. G. Barrs, M.B.
T. A. Richardson.	S. V. Instone.	W. O'C. Tarrant.

CLINICAL ASSISTANTS.

R. R. W. Oram.	W. C. James, M.B.	W. P. Reynolds.
M. Lubbock.	F. W. R. Romano.	J. T. Brett.
H. L. Champneys.	W. H. Lamb, M.B.	R. A. Birdwood, B.A.
W. A. Kidd, M.B.	T. L. Porter, M.B.	C. F. Pickering.
H. C. Burton.	E. Duke.	C. G. Lee.
A. G. Lacy.	T. R. Judson.	J. S. Clowes.

DRESSERS IN THE EYE WARDS.

D. C. Morgan.	A. H. Jones, M.B.	E. F. Ingram.
D. T. Evans.	S. Smith.	A. W. Green.
H. F. Lancaster.	O. Cusack.	G. Davis.
F. C. Coley.	A. Finch.	

MEDICAL CLINICAL CLERKS.

C. G. Lee.	C. T. K. Shaw.	H. Adcock.
L. H. Stevenson.	J. A. Masters.	J. H. Poland.
E. C. Greene.	J. T. Hinton.	J. Reader.
T. Y. Jones.	J. Morgan.	A. G. Collington.
C. G. W. Lowdell.	W. M. Evans.	J. C. Keer.
J. T. Gardner.	O. Bowen.	J. C. Uthoff.
J. J. W. Grimwood.	E. R. Mansell.	E. J. Donbavand.
C. E. Perry.	A. Smart.	G. F. Croke.
P. F. Gilbert.	P. Haynes.	R. Lee.
J. W. Collington.	J. Johnson, M.B.	J. W. Meek.
H. P. Welchman.	J. K. Womersley.	H. J. Liebsstein.
W. Lane.	A. F. Stevens.	F. B. Maclean.
W. D. Stamp.	G. A. Wright, B.A.	G. H. Parry.
A. M. Turner.	E. A. Jones.	C. Gross.
T. F. Pedley.	J. Hammersley.	W. L. Chubb.
A. C. Brock.	W. Dunstan.	H. A. Baber.
R. A. Birdwood, B.A.	C. St. J. Wright.	V. A. Jaynes.
P. Horrocks.	F. Waddington.	T. W. Richards.
T. Jones.	H. C. Jee.	T. S. Sheldon.
W. Gibson.	T. C. Nugent.	G. Mackern.
L. M. B. Jones.	T. A. Bell.	D. D. Malpas.

ASSISTANT-SURGEONS' DRESSERS.

D. D. Malpas.	H. J. Liebsstein.	F. W. Aphthorp.
A. Smart.	G. A. Wright, B.A.	T. F. I. Blaker.
J. S. Clowes.	A. St. C. Buxton.	T. Hammond.
J. A. Masters.	W. F. Hearnden.	J. H. Barnard.
H. Davy.	A. J. J. Johnston.	W. Stroker.
L. M. B. Jones.	A. Pain.	R. A. H. Hart.
J. T. Hinton.	E. Lynn.	C. J. Plummer.
A. G. Barrs, M.B.	W. Dunstan.	H. O. Stuart.
T. Jones.	J. F. McCrea.	G. B. W. Messum.
W. M. Evans.	G. H. Parry.	J. F. Dell.
J. Hammersley.	F. B. Maclean.	P. Horrocks.
A. G. Collington.	G. F. Crooke.	C. G. W. Lowdell.
O. Bowen.	J. Poland.	J. H. Earle.
J. Morgan.	W. L. Chubb.	E. J. Morley.
T. C. Nugent.	E. R. Mansell.	A. F. Stevens.
P. Haynes.	L. W. Reynolds.	H. C. Jee.
O. T. Slatter.	H. Adcock.	J. Brock.
J. H. Poland.	J. F. Briscoe.	R. A. Ross.
W. H. Puddicombe.	W. Gibson.	E. A. Jones.
A. C. Morton.	R. Lee.	A. G. Wells.
C. Gross.	V. A. Jaynes.	J. K. Womersley.
E. C. Beale, B.A.		

DRESSERS IN THE SURGERY.

C. F. Campe.	D. D. Malpas.	L. W. Reynolds.
J. H. Dunlop.	E. H. Paddison.	T. B. Cross.
C. J. Plummer.	T. Dutton.	J. F. Briscoe.
C. Gross.	J. H. Earle.	W. J. Coles.
J. H. Earle.	A. H. Burton.	H. O. Stuart.
J. Poland.	H. A. Baber.	C. H. Keep.
J. H. Poland.	F. B. Maclean.	B. F. Giles.
A. F. Stevens.	H. L. Cortis.	A. Burt.
H. C. Jee.	J. S. Hooker.	T. S. Sheldon.
W. Dunstan.	J. C. Keer.	R. Steele.
W. H. Puddicombe.	J. G. Graveley.	W. Gray.
T. Hammond.	C. A. Everest.	G. J. W. Flower.
W. F. Hearnden.	R. S. Taylor.	C. J. Parke.
A. J. J. Johnston.	J. K. Womersley.	R. Thomas.
V. A. Jaynes.	E. W. Deare.	R. Parry.
E. Lynn.	W. D. Hartley.	C. Fooks.
O. Slatter.	T. E. Abbott.	S. S. Bowles.
H. J. Liebsstein.	P. James.	F. B. J. Baldwin.
C. W. S. Magrath.	O. Griffiths.	M. J. Hart.
S. A. Davies.	E. C. Beale, B.A.	J. C. Uththoff.
E. A. Jones.	E. J. Morley.	J. Rees.
W. C. Milward.	J. Brock.	H. L. Bates.
A. B. Hammond.	R. J. Bryden.	

DENTAL SURGEON'S DRESSERS.

W. C. James, M.B.	V. A. Jaynes.
A. Pain.	C. St. J. Wright.
C. G. Lee.	G. C. S. Perkins.
W. D. Stamp.	W. L. Chubb.
T. A. Roberts.	J. H. Edwards.
W. A. Green.	F. F. Jones.

AURAL SURGEON'S DRESSERS.

A. W. Green.	C. T. K. Shaw.
M. Lubbock.	A. J. J. Johnston.
V. A. Jaynes.	J. J. W. Grimwood.
J. Reader.	P. James.
C. J. C. Otway.	T. C. Nugent.
J. T. Hinton.	

ASSISTANT-PHYSICIANS' CLERKS.

J. Todd.	W. Lane.	A. J. J. Johnston.
O. Bowen.	J. C. Keer.	A. B. Hammond.
J. Mackern.	A. F. Stevens.	W. H. Puddicombe.
J. C. Wilkinson.	D. D. Malpas.	J. A. Masters.
L. M. B. Jones.	J. Hammersley.	J. Poland.
E. Granger.	O. Slatter.	J. H. Poland.
W. Dunstan.	O. Griffiths.	E. Lynn.
G. Mackern.	J. T. Hinton.	W. D. Hartley.
C. G. W. Lowdell.	R. A. Birdwood, B.A.	

OBSTETRIC OUT-PATIENT CLERKS.

D. C. Morgan.	J. W. Bull.	W. P. Reynolds.
T. A. Richardson.	E. J. Donbavand.	W. Lane.
E. G. Dutton.	C. E. Perry.	C. Gross.
W. P. Turner.	G. Mackern.	J. Hammersley.
R. A. Birdwood, B.A.	C. T. K. Shaw.	C. F. Pickering.
W. Tarrant.	L. M. B. Jones.	O. Bowen.
R. R. W. Oram.	J. J. W. Grimwood.	T. C. Nugent.
C. G. Lee.	J. A. Masters.	C. G. W. Lowdell.

POST-MORTEM CLERKS.

T. E. Abbott.	D. C. Morgan.	L. M. B. Jones.
E. J. Donbavand.	A. F. Stevens.	E. H. Paddison.
C. F. Pickering.	J. F. Briscoe.	C. H. Keep.
J. C. Keer.	E. C. Beale, B.A.	B. F. Giles.
W. Tarrant.	A. G. Barrs, M.B.	R. J. Bryden.
E. Duke.	V. A. Jaynes.	H. O. Stuart.
A. F. Wilson.	C. E. Stanger.	F. L. Milne.
J. Reader.		

EXTERN OBSTETRIC ATTENDANTS.

C. T. K. Shaw.	E. H. Paddison.	O. Bowen.
E. C. Beale, B.A.	J. Hammersley.	H. A. Baber.
V. A. Jaynes.	J. T. J. Morrison.	G. H. Parry.
J. G. Graveley.	A. K. Morgan.	R. A. H. Hart.
J. Reader.	J. T. Hinton.	F. M. G. Smith.
H. J. Liddell.	S. S. Bowles.	R. S. Taylor.
F. B. Macleah.	J. H. Poland.	G. Pilkington.
E. F. Ingram.	H. L. Bates.	J. Osborne.
H. Dismorr.	S. A. Davies.	E. Lynn.
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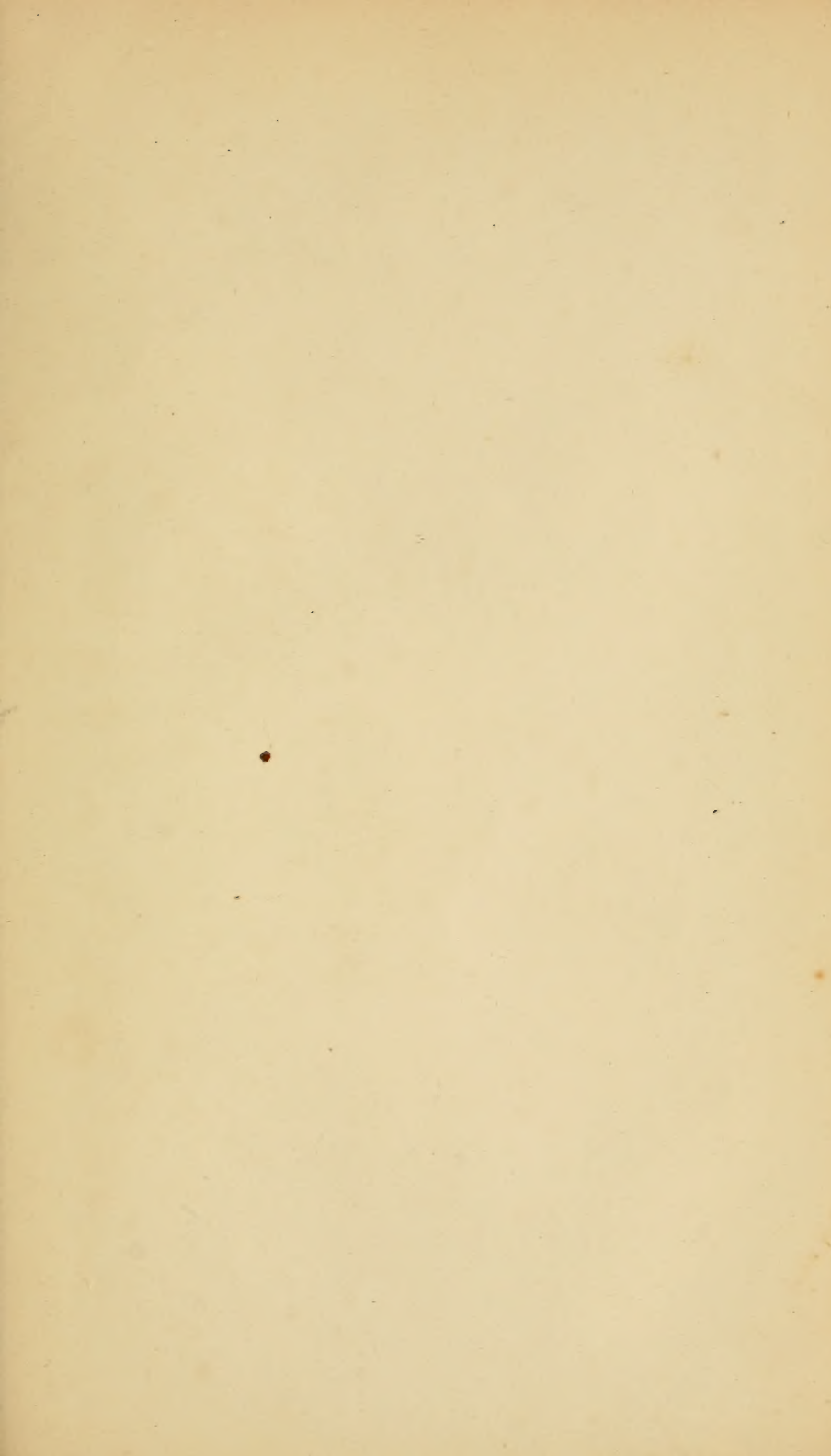
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